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INTERNATIONAL
MONETARY FUND

STAFF PAPERS

Vol. VII October 1959 No. 2

The Theory and Use of Financing Accounts

Earl Hicks *

IT HAS FREQUENTLY BEEN OBSERVED that, while the national income accounts are based on a usable economic theory, the national financing accounts, whose construction is under way or in prospect in many countries of the world, have no such basis.[1]

The framework of the income accounts lies in the Keynesian analysis of saving and investment as an explanation of the cause of the expansion or contraction of income. The key to the need for financing accounts and for integrated income and financing accounts is to be found in the fact that the income accounts are deficient in two respects as a source of data on the variables in the Keynesian analysis. Investment as measured in the income accounts is not a wholly satisfactory measure of the investment variable of income analysis; and the income accounts omit entirely data on money and other financial assets, which are variables that play roles in the income analysis as necessary as those of saving and investment. The need for financing accounts is the need to measure the strategic variable, money, and to provide data on other financial assets in a form in which the causes and effects of changes in the economy's preferences for money and other types of financial asset can be analyzed. The need for integrated income and financing accounts is the need to provide a single set of data that will include measurements of income, savings, investments, money, and other financial assets in a form in which the effects on income of autonomous changes in any of the last four can be analyzed.

Both investment and money are necessary to the logic of the analysis. Which of the two might at any time explain better the source of expansion or contraction, and which is therefore the more useful object of policy, depends greatly on the situation. In a climate that is inflationary, money is the dominant autonomous variable: the economy will expand if the monetary system expands. In a deflationary climate, in-

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[1] This paper is one of a series prepared for the Expert Group on Statistics of Changes in Financial Assets and Liabilities, convened by the Conference of European Statisticians, Geneva, Switzerland, February 23–27, 1959. The series includes the paper by Graeme S. Dorrance, pages 168-209 of this issue of *Staff Papers*, and one by Poul Høst-Madsen which will be published in a later issue.

vestment is the dominant variable: the economy is not likely to expand unless investment expands. The Keynesian analysis was developed in a period of depression. During all of the postwar years, and probably at most times and in most countries, borrowers have been plentiful and it is more nearly true to say that the willingness of the money and banking system, and ultimately of the monetary authorities, to lend is the limiting, and hence the autonomous, factor. Money as a variable in analysis and policy formation has the further advantages of being measured relatively easily and subject to control by the monetary authorities. It is, in any event, important that the national accounts include measurements of both investment and money and the items through which either may be seen to work.

Sector Net Lendings and Net Borrowings

Investment in the Keynesian analysis has no very exact meaning. It is a shorthand expression for supposedly autonomous sources of expenditure. The income accounts, however, give to investment the precise and literal meaning of real capital formation. The government's deficit appears as a negative saving rather than as a source of expansion; exports, which are largely an autonomous force from abroad, are netted against imports as foreign investment; and other classifications are made that cause the data to measure something other than Keynes' "saving" and "investment." Measuring real capital formation provides a useful part of a set of social accounts, not only because we want to know the amount of capital formation in order to assess real progress in the economy, but also because in the search for the source of economic expansion and contraction capital formation provides a valuable element. But real capital formation, literally defined, does not measure Keynes' investment.

Integrated income and financing statistics require that the income accounts be sectored and that capital transfers and transactions in so-called "existing assets" be added to obtain sector totals of net lending, the link with financing data. The measurements of sector net lendings that result are useful supplements to data on capital formation in seeking measurements of expansionary forces. The government deficit appears as a source of expansion. Expenditures for the construction of privately owned housing, which may be a large part of real capital formation, can be attributed properly to the household sector rather than to a fictitious "business" sector, and purchases and sales of real estate, which cannot play any role in over-all accounts, can be en-

tered in the picture. Since some sectors (primarily the household sector) are persistent surplus sectors and others (primarily the business sectors) are persistent deficit sectors, time series of net lendings by sectors are useful for observing changes in the usual positions of the sectors. Measurements of sector surpluses and deficits do not provide, any more than do capital formation and savings statistics, unambiguous measures of the variables needed for Keynesian analysis, but they do provide information for use in examining capital formation totals for some of the causes of excessive or deficient expenditure.

Because they are the link between income data and financing data, sector net lendings can be calculated by extending "downward" the income accounts, or by extending "sidewise," to the accounts of all sectors, the types of data on financial assets and liabilities found in money and banking statistics. The accounts of the money and banking and financial system can provide a large part of the necessary data and in a highly reliable form. In all economies, a substantial amount of borrowing and lending is indirect. The institutions in the middle of the indirect process are necessarily few, compared with the numbers of primary borrowers and lenders, and they necessarily keep accurate records, which the primary borrowers and lenders are less apt to do. Financing accounts constructed from the "sidewise" extension of money and banking statistics to include the accounts of the other parts of the financial system with assets (and so far as possible, liabilities) classified by the economic sector against which they constitute claims (or toward which they constitute liabilities) go a long way toward the completion of a matrix of all borrowings and lendings. Although data on the assets and liabilities of financial institutions are relatively easily available and provide a large part of the data required for financing statistics, they have not—except for the accounts of the money and banking system—been assembled in most countries. The first conclusion in respect of the construction of financing accounts seems to be that work should begin here in order to provide much of the necessary data. Such differences as may exist between (1) the money and banking and insurance sector accounts needed for the financing accounts and (2) the data on these sectors now assembled by the International Monetary Fund in the Monetary Surveys and the Life Insurance accounts in *International Financial Statistics* should be examined, and if possible reconciled, and work on the assembly of data for all other financial institutions should be begun.

The purpose for which financing accounts are constructed is not revealed either by an examination of the usefulness of statistics of sector net lendings and net borrowings or by the fact that the accounts of

the money and banking and financial systems are useful in the construction of financing accounts. Nor does either of these considerations provide a guide to the construction of financing accounts. If financing data were useful only for analyzing sector net lendings and net borrowings, no use would be made of the components. The role of the money and banking system and of all other financial institutions would be obscured instead of clarified since, for the financial institutions, net lending and net borrowing are essentially zero. The significance of the money and banking and financial system lies in the fact that what it lends and what it borrows are different things. Its net lendings reflect only the fact that financial institutions are also businesses. It would therefore be an aid to the understanding of integrated income and financing accounts to include the income transactions of financial institutions with those of the business sector so that there would be no near zero figure reported as the net lendings of the financial institutions. The combined financial and nonfinancial business sector could then be divided in the financing accounts into its nonfinancial and financial parts.

Components of Financing Accounts

There are three possible systems of components for financing accounts. The accounts might be directed to the measurement of intersector finance: they would then measure either each sector's lendings to and borrowings from the other sectors or the increase or decrease of each sector's claims on and liabilities toward the other sectors. Because of the existence of capital market securities, these two things are not the same. Alternatively, the accounts might be directed to the measurement of sector liquidity, measuring for each sector increases or decreases in each of several types of financial asset and financial liability. There are strong reasons for preferring the last of these three possibilities.

Savings not directly invested must take the form of some financial asset (or of a reduction of some financial liability). Investment not financed from income must be financed by the sale of some financial asset or by incurring some financial liability. Savers do not decide to finance others' deficits, and surplus sectors do not decide to finance deficit sectors. Savers, or sectors with surpluses, decide to buy financial assets or to reduce their financial liabilities to suit their preferences for liquidity and yield. The financing accounts can tell us the kinds of asset that were bought by surplus sectors, the kinds of financial liability that deficit sectors issued, and the kinds of financial liability that financial

institutions issued. It is here that the interest and importance of financing accounts lies and that guides to their construction can be found.

The asset preferences of those with surpluses are made to accord with the types of liability that those with deficits are able and willing to incur, partly through changes in relative interest rates and security prices and partly through the operations of the financial system. The financial sectors of the economy can be defined for the purpose of making financing accounts as that part of the economy whose business is the creation of types of asset that the economy wants to hold, primarily to satisfy its preferences for liquidity. The financial sectors are those parts of the economy which are willing and able to have quick liabilities greater than their quick assets. Their quick liabilities provide the economy's liquidity and are therefore in demand.

Among the assets that the economy holds is money, and the role of money is special. Money is the most liquid asset. Money carries no interest rate and has no price, and, except in times of deflation, its quantity is fixed by the actions of the money and banking system. The economy can satisfy an increased preference for other types of financial asset by moving funds from one type of holding to another and/or by raising the value of its existing holdings through the attempt to acquire more. For example, the economy can satisfy an increased preference for savings and loan shares by buying more of them and increasing the size of the savings and loan institutions in the economy's financial system. It can satisfy an increased preference for bonds by attempting to buy them and hence raising their prices. Raising their prices will increase the supply of bonds by inducing borrowers to offer bonds rather than other types of security, and at the same time it will directly increase the money value of all the economy's holdings of bonds acquired in earlier periods. An increased preference for money, however, cannot be satisfied by inducing an increase in the quantity of money; neither, since it has no price, can its price be raised. It must instead be satisfied by deflating the economy through a fall in prices and incomes, a rise in interest rates, and a fall in the values of all other assets.

Financing statistics are valuable largely for the data they provide for analyzing the consequences of changes in the supply of, or preferences for, money and other types of financial asset. It therefore follows that

(1) Financing accounts should record assets and liabilities in a form which makes it possible to measure the liquidity and yield choices of holders. To do this, the sectors distinguished in the accounts should be calculated by summing groups of persons or institutions. Conceptual

entities made by splitting the accounts of persons or institutions that keep single accounts and act as a single unit cannot have financing accounts that show the assets that the members of the sector choose to hold. A sector of this kind might have a calculable surplus or deficit, but there would be no useful way of determining which borrowings and lendings or which changes in assets and liabilities financed its surplus or deficit.

The accounts of sectors that represent sums of persons or institutions should include intrasector financial transactions. The data should include corporate securities held by corporations, and mortgages and other liabilities of households held by households. Claims of any given type against other members of one's own sector serve the purpose of providing their holder with liquidity and yield quite as well as claims of the same type against other sectors. Without their inclusion, the accounts would not be addressed to the question of why the sectors hold the assets they do.

Such accounts should also be gross in a second sense: liabilities are not offsets to assets. The sectors obtain the liquidity they require through changes in their assets and changes in their liabilities. Measurement of the motivations of their actions and of the effects of their actions on the economy depends on the separate recording of both changes in assets and changes in liabilities.

(2) The accounts should separate money from other financial assets, use the word "money" to describe the assets included, and provide in the entries for the money and banking system's liabilities the total of the economy's money supply. The measurement of the role of money is the most important single purpose of financing accounts. To name the entry "money" is consistent with the useful practice, elsewhere in the national accounts, of identifying significant economic variables by commonsense names, e.g., saving, investment, and income, and takes cognizance of the fact that money cannot be usefully defined for all countries of the world as the sum of any particular combination of currency and deposits. Use of the word "money" would permit the legal definition to vary from country to country and yet maintain consistency in its economic definition.

To include in the accounts the total for money, it is necessary to record under other headings holdings by the government and by foreign governments and foreign banks of the items that would otherwise be called money, and to exclude by consolidation, or to include under a separate heading, intrabank claims.

Holdings of currency and demand deposits by foreign governments and foreign banks are foreign exchange liabilities that should be re-

corded as such rather than as money. Government holdings of currency and demand deposits should be excluded from the definition of money since the government is not a sector that can be presumed to be motivated by considerations of liquidity. While there are some who argue that government holdings of currency and deposits are money, others maintain that a government's financial transactions with its central bank are in effect a single set of transactions and that government holdings of claims on the central bank should be netted against its debts to the central bank. The recording of government holdings under a separate heading serves both views. Intrabank claims consist of reserve money and deposits of commercial banks with other commercial banks. The separate identification of reserve money would be a useful feature of the accounts.

(3) The financing accounts should provide sectors for financial institutions and should separate the money and banking system from other parts of the financial system. Financial institutions may be defined as those whose principal function is the provision of assets that the economy wishes to hold, primarily to satisfy its needs for liquidity. The money and banking system may be defined as that part of the financial system which provides the assets called money and its closest substitutes, such as savings deposits, which can be called quasi-money. The accounts should also be constructed in such a way as to facilitate further classification of the money and banking sector into its three principal components: the monetary authorities, the deposit money banks, and the savings banks and similar institutions.

The definition of money and the definition of the money and banking system involve departures from the rules recommended in (1) above. They involve the creation of a split personality if the accounts of the money-issuing authority are to be reported in a single sector, since in most countries the government is the creator of part of the money supply. They also involve the exclusion of some intrasector claims if deposits between commercial banks are not to be included.

(4) Life insurance and pension funds fall under the definition of financial institutions as institutions whose business is the creation of assets that the economy wishes to hold. There are a number of reasons why their accounts should be reported as those of a separate sector.

Their receipts are partly receipts of others' savings and partly payments for a service. On the part of the payers, there is question whether premiums are expenditures or purchases of assets, and insofar as they are thought to be acquisitions of assets, there is question about the value of the assets acquired: the face value, the actuarial value, the surrender value, or the loan value of the policy. Insurance premiums

are, moreover, contractual payments which it is desirable to separate from other savings and asset holdings. For these reasons, it seems preferable to make life insurance and pension funds a sector, to record their income transactions, and to record in that sector the savings of others that take the form of insurance holdings. The life insurance and pension sector would therefore appear to be a large net saver, with large holdings of financial assets, and with essentially no financial liabilities. This treatment of insurance would be parallel to the inclusion of the social security system in the government's accounts. The principle of not splitting personalities leads to the consolidation of the social security system with the central government account, with premiums recorded as government income and benefits recorded as government expenditure.

Casualty insurance companies fall entirely outside the definition of financial institutions. Like many other businesses, individuals, and nonprofit organizations they hold large assets, but unlike financial institutions they do not create assets for others to hold.

(5) Among the economy's real assets, real estate is that which is most similar to financial assets in that it is frequently held as an alternative to other financial assets rather than for direct use. It would be desirable, therefore, if the capital reconciliation account distinguished real estate transactions from other investment transactions. To sector the accounts and calculate sector net lendings, transactions in so-called "existing assets" must be added to capital formation expenditures. Real estate is the principal component of existing assets. For the economy as a whole, there are no transactions in "existing assets," and capital formation is the relevant concept. For the sector accounts, however, interest lies in the identification of sources of expansion and contraction; if these are to be properly attributed to the sectors, purchases and sales of existing assets must be included on the same footing with expenditures that result in new capital formation. The sectors choose to acquire capital assets; they do not choose to add to capital formation. The measurement of transactions in existing assets serves no purpose other than to complete sector accounts made in the first instance with capital formation entries appropriate to the total account rather than to the sector accounts. The measurement of real estate transactions, the principal component, serves the purpose of separating from other capital expenditures that which may in many cases be a transaction in a financial asset rather than in capital goods. It would therefore add to the usefulness of the accounts if, in the capital reconciliation account, fixed investment expenditures were classified as real estate and other fixed capital expenditures, rather than as new capital formation expenditures and transactions in "existing assets."

(6) Liquidity is an asset and not a transaction. Financing data can measure the transactions that the sectors made to obtain liquidity and can show how these led to the finance of investment. They cannot, however, measure either the amount of the sectors' liquidity or the effects on the values of assets of changes in asset prices and interest rates. That the economy's wish to maintain a relationship between the values of its various assets is an important source of its actions implies that a complete set of national accounts needs not only financing accounts but also asset and liability accounts, at least for financial assets and financial liabilities. Inasmuch as the balance sheets of the financial institutions and others are a major source of the available data on finance, asset and liability data for the principal financial sectors should be as easily available as financing data, and their construction might well proceed simultaneously.

Balance Sheets in a System of Economic Accounts

Graeme S. Dorrance *

Basic Postulates

THE FINANCIAL ACCOUNTS that have, thus far, been prepared by national statistical authorities display a remarkable heterogeneity.[1] In particular, there is no agreement as to whether it is most useful to measure the financing flows that are associated with income and expenditure transactions, or whether it is more desirable to compile balance sheets for individual economic sectors.

The purpose of this paper is to examine some of the theoretical considerations that might provide a foundation for a system of financial accounts, and some of the practical conclusions that appear to arise from these considerations. It is not its purpose to propose a form that might be adopted for the construction of financial accounts.

Most of the accounts that have so far been developed are compiled on the assumption that financing transactions are essentially passive reactions accommodating income, consumption, and investment transactions, and do not themselves induce any reactions in the other accounts. They are compiled on the assumption that, as far as the money and credit entries are concerned, the problem is to show the "main work that money and credit do in clearing markets."[2] Thus, in the system of equations underlying the Netherlands Central Economic Plan, there are no equations relating to the financing items in the Monetary Survey that it contains.[3] This paper, on the contrary, is based on the assumption that financial transactions are positive factors inducing reactions in income and expenditure accounts. They are not merely passive reactions to income and expenditure transactions.

* Mr. Dorrance, Chief of the Finance Division, has been a lecturer at the London School of Economics and a member of the staff of the Bank of Canada.

[1] This paper was prepared for the Expert Group on Statistics of Changes in Financial Assets and Liabilities, convened by the Conference of European Statisticians, Geneva, Switzerland, February 23–27, 1959.

[2] Ralph A. Young, "Federal Reserve Flow-of-Funds Accounts" in "Recent Developments in Monetary Analysis," *Staff Papers*, Vol. V (1956–57), p. 328.

[3] Central Planning Bureau, *Scope and Methods of the Central Planning Bureau* (The Hague, 1956), Appendix II.

The first basic postulate of this paper is that it is important to measure borrowing and lending within a community. Yet these financing transactions may have meaning only insofar as they can be rationally explained. It is argued that a rational explanation of financing transactions requires a comparison of asset and liability aggregates. Thus, it follows that balance sheets are an essential part of an integrated system of income and financial statistics.

The second basic postulate is that all receipt and payment flows in an economy are interdependent. No single flow can be considered completely autonomous or completely induced. Any exogenous influence on a flow of transactions will lead to induced changes in all the other flows. These induced changes will, in turn, induce changes in the flow originally affected until the system settles with a new equilibrium structure of flows that is different from the original structure. Some of the flows and balance sheet entries (e.g., money, taxation and government expenditure, and exports) are more subject to exogenous change than others and should be highlighted in a system of accounts. Others (e.g., consumption) tend to be immune to exogenous change.

Certain fundamental assumptions form the basis of the argument; the three most important are as follows:

1. The economic transactions during any period may be measured by the sum of the transactions of all economic units during the period.
2. Each economic unit attempts to maintain certain rational relationships between all the economic factors that affect it, by making adjustments in those economic factors which it is able to influence.
3. Each economic unit has a unique pattern of desires, but many units display considerable similarity of pattern.

If it is assumed that each economic unit tries to maintain stable relations between the several economic factors over which it has control, it is meaningful to measure these aggregates for individuals and groups of individuals, even though there may be no directly parallel relations for the community as a group. For example, the income of any unit may be considered by the unit to be exogenously determined. The unit may decide to divide its income between consumption and saving, and at the same time to divide its savings between the purchase of physical assets and loans to other units. If the forces determining them are stable, these relationships should be measured even though, for the economy as a whole, investment must equal saving, and investment plus consumption must determine income. However, the compilation of balance sheets for economic sectors is

rational only if there is a reasonable degree of homogeneity in the desires of the units comprising each sector, and a reasonable degree of difference between the desires of units in different sectors.

In determining the criteria for economic accounts, certain relations, among others, are assumed to determine the pattern of action by economic units. These relations may be summarized as follows:

1. Each economic unit regards the flow of liquid resources accruing to it as forming a single total for expenditure that is rationally allocated among different uses. Funds arising from income earned, current transfers received, depreciation allowances, debt maturities, capital transfers, borrowing, the sale of assets, and all other sources provide a single sum of available funds that is distributed rationally between consumption, the purchase of physical assets, the acquisition of financial assets, and redemption of debt. (For businesses, the distribution of dividends is considered to be analogous to consumption.)
2. Each economic unit will wish to divide its total receipts between consumption and the acquisition of assets so that the marginal rates of satisfaction to be obtained from consumption and from the possession of assets are equal.
3. Each economic unit will attempt to add to its receipts by borrowing if it believes that the present benefit to be derived from borrowing is greater than the capitalized future cost of the borrowing.
4. Every economic unit owns some salable assets.
5. The amount of assets that a unit wishes to hold will be dependent on the income of the unit and the rate of return on assets.
6. An economic unit will divide its assets rationally between physical assets, nonliquid financial claims, and liquid assets, and will also attempt to make rational distributions within these groups.
7. The desired ratios between these groups will be determined by desires for liquidity, the relative rates of return on different types of asset, and the income and wealth of the unit.
8. The total wealth, the ratio of total assets to total liabilities, and the structures of both assets and liabilities, which each economic unit seeks to achieve, will alter with changes in expectations regarding the future.
9. The prices, and hence the values, of existing assets are continuously adjusted so that the ratio of their value to the cost of newly available capital assets reflects the ratio of their return to the return on newly available comparable assets.

Certain of these assumed relations should be emphasized. The distribution of income between consumption and saving is assumed to involve independent but interrelated decisions. The distribution is not assumed to be one where "part of the disposable income is used for consumption while the remaining part equals savings."[4] The distribution of assets among physical assets, nonliquid financial claims, and liquid assets, and the acceptance of liabilities are assumed to reflect voluntary decisions to change holdings of these assets, or to change outstanding indebtedness.

From these assumptions, a number of criteria regarding the development of financial accounts may be derived. The net borrowing or lending by any sector may be viewed as the net withdrawal or release of resources from or to the rest of the economy. If an economic unit's spending during any period is equal to its receipts, it makes no contribution to, and withdraws no resources from, the rest of the economy. If it spends more than it receives (i.e., borrows from the rest of the economy), it draws resources away from the rest of the economy. If it spends less than it receives, it makes resources available for use by the rest of the economy.[5] Thus it may be considered that the influence of any sector leading to contraction or expansion of demand is indicated by its net borrowing or net lending.

In most countries, a dynamic equilibrium is possible only if persistent net borrowing and net lending desires are equalized. Certain economic units may be considered to have normal desires for persistent financing in one direction. Generally, persons wish to accumulate financial assets. A dynamic equilibrium can be maintained only if businesses and others are willing to become continually more indebted. On this basis, the personal sector may properly be considered as inducing expansion only when it wishes to lend less than might be expected on the basis of past experience, and the business sector may be considered as contributing to expansion only when it wishes to borrow more than might be expected.

If lendings and borrowings are among the significant factors determining the community's receipt and outlay patterns, a set of integrated economic accounts must contain entries designed to explain their magnitude. Lendings are accumulations of claims on others or retirements of debt. Borrowings are acceptances of debts or the realizations of

[4] Ministry of Finance, Division for Economic Affairs, *Economic Survey, 1957* (Helsinki, 1957), p. 16.

[5] If this paper had been written a quarter of a century ago, these sentences would probably have read: "If it invests more than it saves, it provides a net demand for the product of other economic units. If it saves more than it invests, its demand for the economy's production is less than its contribution to production."

claims on others. In practice, net lendings for any unit will probably represent a sum of accumulations of some financial assets and retirement of some debts that is greater than the sum of realizations of some financial assets and acceptance of some debts.

As lendings and borrowings are changes in stocks of assets and liabilities, they cannot be adequately explained solely on the basis of flow analysis. Other things being equal, an individual who owes nothing should be more willing to accept a liability than one who is deeply indebted. A business that is suffering financial stringency should be more willing to build up its money holdings than one that is excessively liquid. It follows that changes in assets and liabilities can be understood only in the light of the total amounts outstanding.

If an integrated set of economic accounts is to recognize that financing transactions may represent forces influencing income and expenditure transactions, and if it recognizes that financial transactions may arise from the desire to change balance sheet ratios, it follows that a fully articulated set of economic accounts must include balance sheet statistics.

If this be granted, three basic questions must be answered: (1) For whom should balance sheets be compiled? (2) How should balance sheets be constructed? (3) How may balance sheet statistics best be integrated with other economic statistics?

The first question comprises two subquestions: (a) What criteria should determine the grouping of balance sheets? (b) Which groups of economic units have sufficient homogeneity and individuality to warrant their inclusion in separate sectors?

The second question also comprises two subquestions: (a) How should the assets and liabilities of each sector be classified? (b) How should the individual items be valued?

Likewise, the third question comprises two subquestions: (a) Is a complete formal integration of financial and income-expenditure accounts necessary? (b) What problems must be faced in attaining the desired degree of integration?

A fourth question also warrants attention: (4) How should the data be compiled?

Criteria for Sectors

The first of the relations, postulated above as determining the pattern of action by economic units, was that each economic unit regards the flow of liquid resources accruing to it as forming a single total for expenditure that is rationally allocated among different uses. One of

the fundamental assumptions stated above was that each economic unit has a unique pattern of desires, but large numbers of units display considerable similarity in the form of their desires. These two hypotheses provide the basic foundations upon which criteria for the classification of the economy into sectors may be developed.

The requirements of balance sheet accounting are fundamentally different from those of national income accounting.[6] The purpose of balance sheets is to measure the assets and liabilities that economic units accumulated in the past, the historic reactions of economic units to changes in their asset and liability positions, and the changes in financial relationships that were coincident with changes in the expenditure patterns of economic units. If some patterns of community reaction are derivable, the meaning of current asset-liability relations can be indicated, and the effectiveness of possible monetary, other financial, and other economic policies can be assessed. Income and expenditure accounts are purposely designed to provide a systematic presentation of the major economic flows in the framework of a comprehensive accounting system that facilitates the understanding of the statistical relationships among these flows, that is sufficient for an understanding of the allocation of resources among types of end use, and that is relevant to problems of effective demand.[7] Thus financial accounts must be directed toward a measurement of the reactions of economic units, while national income and expenditure accounts are directed toward a measurement of the flows of resources that are produced and consumed within the economy.

On the assumption that each economic unit attempts to maintain certain rational relationships between the several economic factors that it is able to influence, it follows that in financial accounts all the transactions, assets, and liabilities of each economic unit must be consolidated in one integrated set of accounts. That is, if any accounts for a unit are included in the accounts for a sector, all its accounts must be included in the accounts of that sector, and none of its accounts may be included in the accounts of any other sector. Income and expenditure accounts may properly distill all flows into one set of sector accounts, bringing all similar flows into one account and leaving other noncomparable flows produced by any unit to be handled in another account. Thus, the sector account for enterprises may well include the production accounts of all "firms, organizations and insti-

[6] Throughout this paper, the model of national income accounts presented in United Nations, Statistical Office, *A System of National Accounts and Supporting Tables* (Studies in Methods, No. 2, New York, 1953), is taken as the standard model for national income accounts.

[7] *Ibid.*, pp. 2 and 3.

tutions which produce goods and services for sale . . . [including] all unincorporated private enterprises . . . , all households . . . in their capacity as landlords of dwellings whether or not they occupy their own properties . . . , nonprofit institutions serving enterprises . . . , [and] all public enterprises . . . such as nationalized industries, the post office and local authority housing estates."[8] This system requires the production accounts of self-employed individuals to be placed in a set of sector accounts different from the set that records their consumption; it places the imputed rental product of a house-owner in a set of accounts different from those recording his imputed rental expenditure. That is, the income and expenditure accounts provide for "split personalities," whereas the asset-liability relations that must be the center of balance sheet accounts, with one exception,[9] make the provision of accounts for split personalities impossible, or an exercise in arbitrary unrealistic allocation.

If each economic unit has a unique pattern of desires, but large numbers of units display considerable similarity in the form of their desires, it follows that any sector classification for national balance sheet accounting must be based on the reaction of economic units to balance sheet changes. The definitions of sectors should include in each single sector all the economic units that are likely to have similar reactions to changes in their balance sheet relations, while excluding from that sector all units with different desires. In national income accounts, it is reasonable to include privately owned companies and government agencies in one sector, and also to include some of the accounts of self-employed individuals and all private houseowning accounts in the same sector. In fact, it is reasonable to put some of the accounts of almost all economic units in the enterprise sector. Similarly, it is reasonable to say that all governments provide welfare services and allocate all their welfare actions to one sector account. This splitting of the accounts of individual units, and the inclusion of disparate entities in single sectors in balance sheet accounting, would destroy the individualities that sector balance sheets should underline.

If economic units could not be classified into groups, each group having a certain degree of homogeneity and a certain degree of difference from other groups, there would be no case for creating sector accounts. However, similarities exist for certain economic units and fairly wide gulfs separate different types of unit from each other. Thus, individuals hold assets for reasons different from those influenc-

[8] *Ibid.*, p. 11.

[9] As is noted below, the accounts relating to certain government functions may be shown separately from other government accounts, without, in fact, violating the principle of "no split personalities."

ing business. Yet all individuals may be expected to show considerable similarity in their reactions to forces influencing their balance sheets. At the same time, a certain degree of homogeneity may be expected in the reactions of businesses. The insensitivity of governments to a high level of indebtedness often amazes businessmen conditioned to the need to maintain balance sheet ratios that will satisfy shareholders, bankers, and others. The independence of national governments from balance sheet considerations permits a special treatment of their accounts and allows for the splitting of their balance sheets to include some of their accounts (e.g., those relating to central banking) with the accounts of other sectors. The reactions of foreigners may be relatively uninfluenced by the small parts of their balance sheets that appear as the country's international indebtedness accounts.

It follows that the criteria for identifying and delimiting the economic units that should be joined together in a sector require (1) the inclusion, with few exceptions, of all the activities of any economic unit in one sector, and (2) the limitation of each sector to units showing generally similar reactions to changes in their assets and liabilities.

The Sectors

The economic units of an economy may be considered as forming two groups of sectors. One group consists of the sectors that, taken as groups, are able to exercise considerable independence of action because, as groups, they are not unduly constrained by the need to maintain balance sheet ratios. The measurement of the balance sheets of these sectors is useful not only for itself, but also because the liabilities of these sectors are important assets for the other sectors. The second group consists of the sectors that must, to a considerable degree, adjust their balance sheet relations to the balance sheet decisions of the independent sectors.

Three major types of sector form the independent group: (1) those sectors whose major activity is the creation of financial assets for other sectors, and the acceptance of liabilities of the other sectors, i.e., the financial sectors; (2) the government; (3) foreigners.[10]

The financial sectors may be sharply separated into the Monetary System and the Remaining Financial Sectors. The Monetary System may be envisaged as standing ready at all times to buy, or sell, at stated prices certain assets less liquid than money (the interest rate

[10] See below for a discussion of the special significance of foreign assets and liabilities held by residents (p. 187).

structure), and as being able to accommodate the associated changes in money. The rest of the economy may be envisaged as attempting to adjust its holdings of all other assets, and its liabilities, to its holdings of money. Except under conditions of hyperinflation, or when there is no demand whatever for loans and a complete unwillingness by the rest of the economy to sell financial assets, a change in the policies of the Monetary System must lead to an expansion or contraction of money, with consequent attempts by the rest of the economy to expand or contract the values of their other assets and their liabilities. Creators of financial assets other than money must do two things. They must create their own liabilities of such a type, and with such a yield, that they will be more attractive than money for others to hold. They must be able to find borrowers who will pay enough for loans to cover the interest and other costs of these institutions. The Monetary System also lends, but its monetary liabilities normally bear no interest. The lending rates of the Monetary System are the prices of marginal transactions in the money market. They determine the prices that must be demanded by the other financial institutions. Thus the Monetary System has an independence denied to all other parts of the economy, except the government.

There are limitations on the Monetary System's independence; a Monetary System composed of one agency creating money, which is free to ignore international repercussions, is independent. If there is more than one bank in the community, each of the banks will have to maintain certain ratios of liquid assets to liabilities. In most modern societies, an agency (or agencies) is given a monopoly of creating the money with which the units in the banking system make settlement between themselves—reserve money. This agency is also usually given a monopoly of the issue of all, or most, of the economy's currency. These Central Monetary Authorities are the only parts of the Monetary System that may be considered as having complete autonomy (even if this autonomy be voluntarily limited by considerations of social policy). Any set of financial statements should record the accounts of this autonomous sector separately from the accounts of all other sectors or subsectors.

In one respect, the autonomy of the Central Monetary Authorities is limited. Governments exist to give expression to social desires. Their total incomes and expenditures are determined largely in the light of social needs, irrespective of the financing implications of those decisions. Their asset holdings are generally only incidental to their main activities. Their creation of liabilities is influenced by considerations of social policy rather than by considerations related to their incomes and expenditures. Governments also differ from the Private Sector in that

they are independent. Borrowing by units of the Private Sector must be limited by their prospective ability to redeem debts. Provided a government has the cooperation of the monetary system, it can always meet its national currency obligations. Hence it can determine its borrowing and lending policies solely in the light of social desires. This prerogative of the government limits the freedom of the Monetary Authorities. The latter must provide the finance that the government desires, and they must provide an amount of money consistent with the value of government securities issued. The community will try to bring its holdings of money, government securities, and other assets into alignment. Changes in the relative desires of the nonmonetary sectors for government securities and other assets, and changes in the relative availability of government securities, lead to changes in the prices of government securities. Unless the Monetary Authorities and the government are prepared to acquiesce in the prices so determined, the Central Authorities must be prepared to buy and sell government securities to the extent necessary to satisfy the desires of the government to issue securities, the desires of the Private Sectors to distribute their assets between securities and other assets, and the willingness of the Deposit Money Banks to react to changes in reserve money by buying and selling securities.[11]

In some countries there is only one autonomous agency—the Central Bank. In a large number of countries it shares its powers with a government currency (or coin) issuing agency. In some, Exchange Stabilization Funds create or destroy reserve money following changes in the economy's holdings of international reserves, or other government agencies make direct loans to banks and thus influence the levels of reserve money.[12] The accounts of all these essentially cognate organizations should be consolidated in one set of accounts. Where it is considered desirable, the accounts of the separate units may well be specified separately.

If the accounts of a significant sector are separated to show the accounts of subsectors, the desirability of presenting consolidated or combined accounts for the sector is usually an open question. Unless most of the units in a sector have a certain homogeneity, they should not be considered as forming a sector. Unless they present a certain nonhomogeneity, they should not be separated into subsectors. The

[11] In some countries this adjustment may require the Central Bank, or the Central Bank and the Deposit Money Banks, to hold all (or essentially all) the government securities. (See International Monetary Fund, *International Financial Statistics*, August 1952, for comparative data on the ownership of government debt in 23 countries.)

[12] E.g., the Development Bank in Greece, the Reconstruction Loan Corporation in Germany, and the National Finance Corporation in the Union of South Africa.

Monetary System, however, has certain specific attributes of homogeneity and nonhomogeneity. Each part of the system creates some of the economy's money. Unless a consolidated account is presented for the system, the creation of money will not be adequately explained. Unless separate accounts are presented for each significantly identifiable part of the system, the determination of monetary policy will not be adequately explained. For the Monetary System, both a consolidated account and separate accounts for each group of monetary institutions are significant parts of an adequate set of financial accounts.

The definition of the Monetary System and the identification of the groups of institutions for which accounts should be provided sometimes raise minor problems. In most countries, there is a group of Deposit Money Banks that may be readily identified. In many, there are financial institutions whose liabilities form a peripheral part of the community's money. Where the monetary liabilities of these institutions form a relatively small part of the community's money, and where their monetary liabilities are a small part of their total liabilities, it would seem preferable to include their accounts with those of the nonmonetary financial institutions.[13] In many countries, some government liabilities are money; the coin issue is a responsibility of the government; the Post Office has checking deposit liabilities; the Treasury has direct monetary deposit liabilities.[14] In these cases, the monetary activities of the government should be separated from its other activities. The accounts relating to its monetary activities (including its central banking activities) should be included with the accounts of other monetary institutions. An offsetting amount may be considered as a Claim on the Government.[15] This is one of the few cases where the construction of satisfactorily integrated income and financing statistics is assisted by separating the activities of a single economic unit.

In some countries, there are institutions with very small or even no monetary liabilities whose purpose is solely or primarily to provide services to the Monetary System. These institutions should be considered part of the Monetary System rather than nonmonetary financial institutions or parts of the production-expenditure sectors.[16]

The Other Financial Institutions may conveniently be divided into Life Insurance Companies and Creators of Securities.

One of the most significant financial assets in the modern world is

[13] E.g., the Development Institutions in Colombia, Costa Rica, Ecuador, Guatemala, Haiti, Mexico, Peru, Turkey, the Union of South Africa, and Yugoslavia.
[14] E.g., France and Viet-Nam.
[15] Probably as "Other Loans" in the classification of assets outlined below.
[16] E.g., discount houses in the United Kingdom.

life insurance. Its relative size and its specific character warrant specification of the financial accounts relating to its issue. In return for a specific payment of money, Life Insurance Companies sell an essentially illiquid asset to the insured; in this way, they satisfy the demand of the community that its holdings be distributed between the different ends of the liquidity range of financial claims that are fixed in terms of money. After banks, Life Insurance Companies are usually the most important institutions providing financial assets for the rest of the community and satisfying the community's willingness to accept liabilities. Hence, after banks, Life Insurance Companies provide the most significant source of information on the financial assets and liabilities of the nonfinancial sectors.

The remaining financial institutions are primarily institutions creating securities (even if called deposits) for sale to the private sectors of the economy. By selling securities, they satisfy part of the demand of the community for financial assets. By using the proceeds of these securities as loans, they also satisfy part of the willingness of the community to accept liabilities. In this way they form a further bridge between the asset-holding and liability-accepting (or lending and borrowing) desires of the economy. Being a part of the financial market, these institutions must adjust their actions to the conditions created in the rest of the economy. That is, to the extent that the Monetary System creates money, the government creates securities, and the community wishes to distribute its holdings between money, government securities, and other financial assets, these institutions may find holders for their securities. However, their freedom is strictly limited by the fact that they must find borrowers for the proceeds of their security issues, and the Monetary System is constantly satisfying the demands of a large part of the community to borrow, or to adjust its holdings of financial assets. Hence, the policies of these institutions must to a large degree be determined by monetary policy.

The extent to which the accounts of the other Financial Institutions warrant subdivision into their component parts (Mortgage Institutions, Installment Finance Companies, Investment Trusts, etc.) will depend on the relative importance of the different types of institution, the availability of data, and the national statisticians' desires to show detail.[17]

In many countries, there are financial intermediaries whose accounts are often classed with those of financial-asset creators. Financial inter-

[17] As accounts develop, data for the different types of institution may not become available simultaneously. Hence, accounts for some of the subsectors may be easily obtained as an early step in the development of financial accounts and should be used to provide indications of a fully integrated measure of transactions.

mediaries, whose own liabilities are not held to satisfy the asset-holding desires of the community (stockbrokers, real estate dealers, etc.), should be considered as producers of services and included with the rest of the income-producing units of the economy. Similarly, moneylenders who use their own resources rather than resources obtained through the issue of obligations should be considered part of the business or household sectors.[18]

The balance sheets for the Government Sector differ radically in significance from the balance sheets of the Private Sector. Economic units in the Private Sector must attempt to maintain some relation between their assets and liabilities, between individual types of asset, between individual types of liability, and between individual assets and individual liabilities. As has already been indicated, a government is always able to command liquidity and is independent of considerations arising from its own need to maintain desirable asset-liability ratios.

To a considerable degree, this freedom is fully available only to the National Central Government. Where Local Governments are independent of the Central Government, the accounts of the Central Government should be separated from the accounts of Local Governments.

It has already been suggested that the purely financial activities of the government should be recorded as part of the accounts of the Financial Sectors. The development, housing, and similar actions of governments resemble financial actions. At the same time, they are very similar to other consumption actions of the government, and in most cases should be regarded primarily as factors leading to the creation of government debt, or increasing the taxation requirements of the government. There is an argument for showing these accounts separately in that they help to explain their own reflections as recorded in the accounts of the borrowing sectors.

Many government financing transactions reflect long-term social policies that lead directly to financing surpluses or deficits (unemployment insurance, price stabilization programs, etc.). These activities frequently produce misleading effects in published government financial accounts. The accounting surpluses of government income stabilization agencies are nominally invested in government securities, and their deficits lead to a sale of government securities to the market, or borrowing from the government. In most countries, these long-term social policies account for a large part of government expenditure. They lead directly to the creation or retirement of debt held by the rest of the economy or to changes in government money holdings. Hence, in most

[18] In the U.K. Classification of Bank Advances, loans to professional gamblers are included with loans to financial institutions.

cases, financing accounts should provide supplementary tables for the transactions of these government subsectors.

The accounts relating to the remainder of the Central Government's transactions must provide the master account for the government. All government debt is homogeneous in that, irrespective of its origin, it is viewed by the debt-holding sectors as similar. Over-all government receipt and expenditure policy must be determined in the light of short-term desires for surpluses or deficits and long-term policies. Consequently, the accounts relating to the revenue and consumption activities of the government are the accounts that reflect the final current financing and financial policy of the government.

From the viewpoint of national financial accounts, transactions with foreigners may be considered as analogous to the transactions of an independent sector. The domestic assets and liabilities of nonresidents form only a small part of their total balance sheets. Hence, they form a balance sheet for a split personality with only the significance that such balance sheets may be expected to have. Domestic production and expenditure influence, and are influenced by, the balance of payments. Hence, the domestic sectors may be grouped together; and the transactions of the domestic economy with the foreign sector, and the claims of the domestic sectors on, and liabilities to, the foreign sector, may be measured by the balance of payments and international indebtedness accounts. The foreign sector's asset account measures the nation's foreign liabilities, and its liability account measures the nation's foreign assets.

In many respects, balance sheet analysis must be focused directly on the reactions of the domestic private sectors. These are the sectors that must adjust their balance sheet relations to the balance sheet decisions of the independent sectors. These sectors may be separated into those which are primarily consuming sectors and those which may be thought of as primarily producing sectors—that is, those which account for the personal consumption in the national income and expenditure accounts, and those which account for the major part of the national output. These two groups form the household and the business sectors.

In some respects, the differences between the household and the business sectors are more fundamental for financial analysis than the simple difference that arises from the fact that, for the most part, one sector consumes what the other produces. The ratios of acceptable liabilities to assets are different for the two sectors. The desired values of assets relative to transactions differ. The desired composition of assets and the ability to change the desired ratios are different. Hence, the asset-liability patterns of business and households will differ, and

the reactions of the two groups to economic changes produce differing financing desires.

One basic difference between the views of these two sectors toward their balance sheets arises because households hold physical assets only to the extent that these assets can satisfy certain of their consumption desires, while the ownership and use of physical assets are essential to the production of goods and services by businesses. The risks that a business may prudently accept in order to obtain the ownership of physical assets are larger than the risks that a household may prudently accept.

Businesses attempt to stabilize the incomes of shareholders over relatively long periods, and households attempt to reduce fluctuations in consumption over lifetimes. For business, the associated investment is usually in a form that is considered liquid, and borrowing for dividend stabilization would not be considered prudent by most lenders. The long-term stabilization of consumption by the household sector is likely to be associated with investment in forms that are considered to be illiquid (e.g., life insurance), and borrowing to permit consumption in advance of saving (e.g., hire purchase) is fostered by conservative bankers in developed economies and by moneylenders in less developed countries.

One incentive that businesses have for financial investment has scarcely any parallel in the consumer sector. Businesses use physical assets that steadily become antiquated, but a significant portion of them may be acquired for new investment or replacement only in relatively large discrete units. Hence, as their antiquation progresses, provision must be made for replacement by comparable, or different, assets if production is to continue profitably. This provision may take the form of applying some of the proceeds of sales to the retirement of debt, hence reducing the ratio of liabilities to assets and thereby increasing the ease with which the business will be able to borrow in the future. Or, the retained proceeds may be used to buy liquid financial assets that may be realized when the time comes for the replacement of antiquated physical assets.

The opportunities for possible advantageous purchases are likely to be greater for businesses, and hence the desire for liquidity for speculative purposes is likely to be stronger among businesses than among individuals. For consumers, purchases of goods and services are roughly equal to income. For businesses, purchases of goods and services are greatly in excess of income; and for businesses as a whole, transactions in goods and services, including interbusiness transactions, are greatly in excess of the community's consumption. Nearly every business unit

is in every respect larger than any individual household. This, together with the relatively higher liquidity desires of business, results in the average level of business liquid holdings being higher than the average liquid holdings of consumers. This increases the opportunities to profit by shifting from one liquid asset to another, and consequently reduces the real cost of liquidity.

It is easy to describe the differences between businesses and consumers. It is less easy to identify the two sectors precisely. In the preceding description, it was assumed that households receive wages, salaries, rent, dividends, interest, annuities, or other transfer income and either save it or spend it for consumption. It was assumed that businesses produce goods for sale and use the proceeds for the purchase of intermediate goods and services, savings, or income payments to households. But some individuals also produce goods and services and use the proceeds in part for direct consumption, thus not fitting unambiguously into either category. For income and expenditure accounts, the activities of these individuals may be separated into production and consumption activities, with only an adjusting entry for transfers between the two accounts; for financial accounts, however, this statistical solution is unacceptable. For example, a self-employed producer may acquire liquid assets in order to replace his machinery in the future; however, as long as he holds liquid assets, they also satisfy his need to have protection against personal catastrophe. In the construction of financial accounts, these self-employed producers could be considered as forming a separate sector, or they could be included in the business or the household sector. However, it would probably be unwise to segregate these economic units completely. They may be considered to be primarily consumers who obtain their incomes from production rather than from direct factor payments. Their financial decisions may be assumed to be decisions dominated by the influences that determine the decisions of consumers. Hence, self-employed producers may best be considered as part of the consumer sector. For certain purposes, however, it may be desirable to show at least part of their accounts separately; if this is so, it seems preferable to consider these units as forming a subsector of the consumer sector rather than a separate economic sector. Even if it were decided that they should be considered as a separate sector, it would in most cases be impossible to gather data on this sector's accounts.

For most countries, the business sector should be limited to nonfinancial businesses organized in accordance with the national company or similar laws.[19] Where specific legislation applies to partnerships,

[19] In less highly developed countries, a different basis of separation may be appropriate. Where the company form of organization is not extensive, a separation

it might be possible to include in the business sector partnerships that maintain partnership accounts separate from the personal accounts of the partners. The accounts for the household sector should, conceptually, incorporate the accounts of all individuals.

In the construction of sector balance sheets, it must be remembered that no sector is truly homogeneous. Each economic unit is unique. Inevitably, diverse units will be combined within each sector. A balance must be struck between the need to keep the number of sectors sufficiently small so that the accounts may be comprehended, and the need to insure that there is not too great a diversity between the different units united within one sector. The business sector is not a collection of completely uniform units; it comprises large concerns whose financial decisions may be extremely sensitive to changes in the level and structure of interest rates for borrowing, the level and structure of yields and prospective yields of alternative assets, and alterations in the prospective liquidity of alternative assets. It also comprises relatively small concerns for which the cost of making these comparisons outweighs the prospective gains to be derived by altering asset-liability positions. Hence it may be desirable to compile separate balance sheets for a subsector of large companies and a subsector of small companies.[20] In many cases, this classification may be approximated by a classification that distinguishes between companies whose securities are quoted on an organized stock exchange and those whose securities are not so quoted. This distinction may be significant per se. A company that is prepared to borrow from a market and publish information on its accounts is likely to have a target asset-liability position different from that of a company that borrows only from a few directly interested owners who do not have to publish data on their financial transactions.

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into rich and poor may be the appropriate classification. In most underdeveloped countries, a classification of individuals into those who hold bank deposits and those who do not would effectively separate individuals largely influenced by business considerations from those predominantly influenced by considerations of consumption.

[20] The following comparison of the financing of two groups of U.K. companies in the years 1949–53 demonstrates the possible significance of this type of subsectoring for the business sector:

	Company Saving	Increase in Physical Assets	Net Borrowing
	(In millions of pounds sterling)		
All companies quoted on stock exchanges	2,809	3,210	401
100 largest quoted companies	1,248	1,515	267
Other quoted companies	1,561	1,695	134

Data are from National Institute of Economic and Social Research, *Company Income and Finance, 1949–53* (London, 1956).

The business sector also consists of enterprises engaged in a wide range of economic activities. Some are in expanding industries where the prospects of being able to meet liabilities are more favorable than in contracting industries. Some are in industries that enjoy a stable demand for their products, where the risks inherent in a relatively low degree of liquidity are less than in an unstable industry and where the opportunities for benefiting from liquidity may be either greater or less than in an unstable industry. To the extent that businesses in different industries have different asset-liability desires, separate balance sheets may well be constructed for separate industry groups.[21]

There is another, more fundamental, basis for separating businesses into two distinct groups. In the large majority of countries, most businesses are privately owned. Their production and pricing decisions are influenced almost exclusively by market demand and supply conditions; they must guarantee their liquidity by holding assets that may be realized through sale, or borrowing; and their source of borrowing is the private sector of the economy and private financial institutions. At the same time, in most countries, there are government-owned enterprises. The production and pricing policies of these enterprises may be at least influenced by considerations of social policy. They may be able to find sources of liquidity from the government, and they may be able to obtain borrowings from the government or with a government guarantee. Consequently, these two groups of businesses are likely to have markedly different desires with regard to the size and composition of their assets and liabilities. It follows that their balance sheets are likely to be markedly different in structure, and that it would be desirable either to construct separate accounts for these two subsectors of the business sector, or to limit the business sector to privately owned businesses and to include government enterprises as a subsector of government. On balance, it is probable that government enterprises are influenced more by considerations of a business type than by social policy, and in most countries it is therefore preferable to include them as a subsector of the business sector.

In many countries, the self-employed subsector comprises two distinct groups: farmers and individual providers of services (merchants, professional practitioners, and others) and self-employed craftsmen.

[21] An example of the difference in experience of firms in different industries is provided by the following data (from National Institute of Economic and Social Research, *op. cit.*) on net borrowing for two groups of U.K. companies:

	1949	1950	1951	1952	1953
		(In millions of pounds sterling)			
Chemicals and allied trades	15.3	29.5	104.9	8.5	-22.2
Cotton	-5.5	-5.4	7.6	-11.8	-8.7

These two groups are subject to different economic stimuli, and hence are likely to have different asset-liability structures. For certain purposes, it may be desirable to compile separate balance sheets for these two subordinate sectors.

Many economic units do not fit conveniently into any sector classification. Of these, perhaps the most significant are charitable organizations. These organizations are consumers in the sense that they buy services produced by others so that individuals other than the organization may consume. They are often organized as companies, but are not producers in the sense of creating goods and services. A large part of their income often arises from earnings on investments; hence their investment policies are similar to those of financial institutions. Yet they create no liabilities for others to hold as assets, and therefore they cannot be considered part of the financial sector. In national income accounts they are usually classed as consumers.[22] In some financial accounts they are classed as financial institutions.[23] Neither of these treatments is satisfactory. In some financial accounts they are considered to be a separate sector. This treatment may be the best theoretically, but it seems to give an undue importance to these organizations. Probably the best that can be done is to recognize their corporate ownership and include them, with other nonfinancial institutions, as part of the business sector.

Balance Sheet Entries

The assets and liabilities to be identified for each sector or subsector should be the items that are believed by holders to have specific qualities. These qualities, and consequently the specification required, should be influenced largely by the factors that lead to the acquisition of assets, and the acceptance of liabilities.

Assets may be of two clearly distinguishable types, financial, i.e., claims on others (their liabilities), and nonfinancial, i.e., physical property and claims to resources required for the creation of directly consumable goods and services.

While a financial asset must be the liability of someone other than its holder, there is no fundamental reason for accounts of debtors and creditors to be mirror reflections of each other. Thus a marketable

[22] See United Nations, *op. cit.*, pp. 11 and 12.

[23] This was the original U.S. flow-of-funds treatment; see Board of Governors of the Federal Reserve System, *Flow of Funds in the United States, 1939–1953* (Washington, 1955), pp. 210–12. The current U.S. flow-of-funds treatment is to include charitable organizations with consumers; see quarterly flow-of-funds accounts, *Federal Reserve Bulletin*, August 1959.

fixed-term bond will have a liquidity value to its holder markedly different from that of a nonmarketable bond with the same fixed term. The two should be separated in the accounts of asset holders. Yet both bonds may appear to be identical fixed-term obligations to their issuers and should be recorded together in the liability accounts.

In attempting to classify financial assets and liabilities, liquidity criteria should be the dominant consideration determining the form of classification. Assets are held to provide income and liquidity. Economic units will change the composition of their stock of assets, or will change the relations between their assets and their liabilities, as desires for liquidity change, as the apparent liquidity of assets changes, and as current yields on financial and other assets change. These desires to alter the composition of assets and liabilities will be both the product of changes in the prices of assets and the forces leading to changes in their market prices. While variations in the desired composition of assets and liabilities will be influenced by changes in receipts and expenditure desires, and hence will reflect financial flows, they will also be determined by the pre-existing structures of assets and liabilities and the subsequent structures of assets and liabilities that are desired.

Liquidity criteria may be of two essentially different types. They may derive from the form of an asset, or from the character of its issuer. All claims on foreigners appear to differ in certain respects from claims on residents. This difference has certain purely xenophobic elements. More importantly, a claim on a foreigner carries an exchange rate risk that is not present in a security issued by a resident, even if this is a risk that the claim will appreciate in terms of national currency. Hence, even in a classification of assets and liabilities by type rather than by obligor, foreign assets and liabilities should be differentiated from their domestic counterparts.

Financial assets may be money or immediate claims to money payments, or they may be expressed in fixed money value payable at a specified time. Alternatively, they may be claims to residual values payable at an indeterminate time.

Money, being the most liquid of all assets, occupies a unique position in the range of assets available to the community. After money, assets may be ranged, conceptually, in a descending order of liquidity; but in practice, a statement of this array is impossible. Some assets are so close in nature to money (e.g., savings deposits) that only by an arbitrary decision may they be separated from money. Certain securities (e.g., treasury bills) may, in certain respects, be more liquid than quasi-money. Extensive work to define items precisely and to arrange them accurately in a liquidity array is not likely to be fruitful.

While money may be considered as the most liquid of assets, and while certain types of money (e.g., token coins and notes) may unequivocally be classed as money, for most countries a strict delimitation of money is likely to be impossible. Changes in certain types of asset that are classified as money may have a significance different from that pertaining to other types of money. Consequently, it is reasonable to provide separate statements for currency and deposit money.

Quasi-money may be defined to include those assets which are superficially similar to deposit money but which are not regarded by their holders as money. Its similarity to money justifies granting it a special place in a liquidity array and a separate recording in any schedule of assets. Money should be specified, but, for certain analytic purposes, it may be the sum of money and quasi-money that should be related to other magnitudes.

Financial assets with a fixed monetary value, other than claims on the monetary system and foreign exchange, may conveniently be classified as bonds,[24] annuities and cash values, and loans. Securities may be the obligations of governments or of others. They may be the obligations of national or foreign governments, or of central or local governments. The ability of national central governments to issue securities without consideration of the eventual problem of their redemption leads national central government bonds to occupy a unique position in a liquidity array of the community's assets.

Bonds, irrespective of their issuer, are liquid only to the extent that they may be effectively realized. Some bonds issued by some governments are redeemable on demand and are almost equivalent to quasi-money. In some analyses their amounts are added to quasi-money, on the assumption that the community is indifferent in its views of the two assets.[25]

Assets may be considered liquid only to the extent that they may be converted into money and to the extent that their holders have assurance that this conversion will be possible in the future. In most cases, bonds are repayable on a fixed date, or within a narrow range of dates, and yield a predetermined interest income. Thus a bondholder has a predetermined income and a capital value obtainable at a certain future time. If a bondholder is free to sell the sum of values represented by a bond, he is able to obtain a present money value for his asset. If for any

[24] The term "bond," as used here, includes all securities repayable on predetermined money terms and thus includes treasury bills, certificates of indebtedness, treasury notes, etc.

[25] E.g., the table, "Composition of Total Domestic Liquid Resources, and the Parties Holding Them," in Netherlands Bank, *Report for the Year 1957* (Amsterdam, 1958), pp. 62-63.

reason a bond is not marketable, or if restrictions are placed on its marketability (e.g., it may not be sold to the monetary system, or to insurance companies), it does not provide the same degree of liquidity that is available in a marketable bond. Asset holders presumably take different views of fully marketable bonds, bonds marketable with restrictions, and nonmarketable bonds. The asset arrays included in financial statements should recognize these differences.

Securities are sometimes differentiated in their essential marketability in that they either are, or are not, discountable at the central bank. A discountable bond will be a preferred asset for the monetary system, and the almost certain availability of a possible bank buyer will make it an asset superior to a security that is not discountable.

The liquidity of a bond is directly related to the certainty with which it may be realized in the fairly near future. This potential realizable value is the probable range of its possible prospective price. At any moment, the price of a bond is the discounted value of all its future interest payments plus its redemption value. The rate of interest applicable to the bond determines this discounted value. However, any change in the rate will have a greater effect on the current price of long interest and redemption streams than on short ones. The prospective short-run price of a short-term bond cannot differ greatly from its present price. In developing an array of assets, all bonds cannot be listed individually by liquidity. Probably the best that can be done is to classify them into three groups, according to their maturity at the time their values are measured: short-term, medium-term, and long-term. Other national government bonds (i.e., bonds of provinces, states, departments, municipalities, and regional authorities) probably follow central government bonds in the liquidity array. In most countries, the certainty of their redemption is an aspect of national policy.

The presumable greater certainty of repayment distinguishes all government bonds from bonds issued by the private sector. The latter are subject to a default risk to the extent that there is a risk of their issuers' becoming bankrupt.

Annuities and other cash values are assets. Their importance in the community's asset structure is likely to influence the relations between various assets and liabilities that the community may wish to obtain. Thus, if the practice of holding life insurance is widespread, individuals and partnerships (and to a lesser extent companies) may not wish to hold other financial assets as alternatives to life insurance. A community with large holdings of life insurance may be more ready to accept large liabilities, or a community with a high propensity to borrow may guard against the consequent risks by carrying a relatively

large volume of life insurance. In most countries, life insurance is the most common form of right to an annuity, or cash value, that the community holds. Life insurance policies also have certain qualities different from most comparable rights. In modern societies, the value of life insurance contracts (irrespective of how this value is measured) is large in comparison to the value of other assets.

The other main category of financial asset fixed in money terms comprises the wide range of other loans that develops in any community. This group must be heterogeneous, extending from secured bank loans obtained by profitable conservatively financed companies to the highly dubious personal loans extended by some moneylenders. One of the most significant components of this group is the mortgages granted primarily to private households, but which should probably also include mortgages obtained by businesses, other than mortgages that are the formal security for bonds. In most communities, there is a market for mortgages. These markets vary from country to country in the liquidity that they give to mortgages, and vary within a country depending on the type of mortgage. However, in most cases, mortgages are likely to be more liquid than other loans. Another component that is frequently significant is consumer installment credit (hire purchase).

All the preceding financial assets have a fixed redemption value. However, the essence of company organization is that its residual ownership is eventually held by members of the household sector. At intermediate stages, it may be held by other members of the business sector, or by financial institutions. But since this equity ownership can have no final redemption value, the prices of equities and their liquidity attributes cannot be determined by a final redemption sum. The absence of a final redemption makes the price of equities less subject to changes in the rate of interest than is the price of bonds.

In turn, it should be recognized that some equities carry a fixed yield and may be redeemable at a stated price, but at an unstated time. These securities have a liquidity value, which should be recognized in financial accounts, that is different from equities with a fluctuating yield and is dependent on the profitability of the company and its dividend distribution policy; these securities are redeemable only on the demise of the company.

Equities that are not eligible for sale on any market are not as liquid as marketable equities. Many of the nonmarketable equities differ little from the marketable type. There may be some tendency for companies whose shares are not marketable to follow financial policies different from those of companies which must publish reports on their actions and thereby face the scrutiny of public comment. Generally,

however, nonmarketable equities are liabilities of smaller companies or of large companies owned by a very few individuals. There is one specific type that is important in most countries. Many companies own the entire equity in other companies. For a variety of reasons, they prefer to own the equity in an operating company rather than to amalgamate the physical assets of that company with their own. Ownership of physical assets in a foreign country is usually possible only by the ownership of direct investment in a foreign subsidiary. Equities in subsidiaries (including foreign direct investment) are different from other nonmarketable equities and probably deserve separate recording in the financial accounts of their owners.

Trade credit is a financial asset that in a liquidity array would be halfway between true financial assets and physical assets. Most financial assets are held because individual economic units wish to hold them and are trying to maintain certain asset values. No individual or company desires to extend trade credit for its own sake. It does so only to increase sales. In many respects, trade credit should be regarded as an income-earning asset with a low liquidity value. An individual account outstanding may be relatively liquid. However, if a firm is in a business where it is customary to extend trade credit, it may expect to remain in business only if it replaces maturing trade credit by new extensions of credit. Trade credit is, in many respects, more analogous to inventories than to financial assets. Individual entries in accounts and individual units of inventory may be realized. However, a stock of both must be maintained. By themselves, they normally produce no direct income. Their maintenance is a cost that restricts the acquisition of other assets or calls for borrowing in order that they may be financed.

Nonfinancial assets are primarily the community's physical capital. There are conceptual assets represented by the valuation placed by individual economic units on their monopoly positions. A set of sector balance sheets recording the ownership values visualized by members of the community should provide an item for goodwill, patent rights, royalties, etc. However, these are relatively insignificant in comparison to the community's physical capital.

Physical assets are of two forms. The first is the long-term physical investment that has been undertaken in order that future consumption may be larger than past consumption. The second is the stock of inventories held by the community. The physical stock of long-term investment goods, owned by any economic unit, may be changed only by relatively small amounts in any one period. The stock of inventories may alter, or be altered, relatively rapidly in response to short-run economic changes. Economic units may express changes in their expectations by

attempting to increase inventories in advance of expected increases in the physical demand for the goods that they produce, or in advance of expected increases in the prices of the goods that they produce or consume. Anticipated declines in demand or prices will produce a reverse reaction. Conversely, a disappointment of previous expectations may lead to quite sharp changes in inventories. An *ex ante* discrepancy between saving and investment is reconciled, in the first instance, partly by changes in inventories. One of the first sources through which excessive demand may be satisfied is through the consumption of inventories. An excess of expenditure desires by the community over expected receipts will be reflected in unexpectedly large net receipts by those in possession of inventories, with a consequent disinvestment in inventories. Disappointed sales prospects will lead to an accumulation of, and undesired investment in, inventories. Hence, inventories are a sensitive element in the balance sheets of economic units. Changes in them provide guides to the degree to which the community has been able to satisfy its desires to maintain a satisfactory asset-liability structure. At the same time, changes in the desire to hold inventories will be associated with changes in the desire to hold other assets, and in the willingness to accept liabilities.

The long-term investment, or fixed assets, held by the community may be divided into income-producing and consumption-producing assets. In large part, this is a distinction between the household sector's assets and the assets of the other sectors. In part, however, if accounts providing for mixed sectors are compiled, a separation of the assets of the mixed sectors may provide some guide to the reasons underlying changes in the balance sheets of these sectors.

Income-producing assets may be either reproducible plant and equipment or nonreproducible land and improvements. One of the prime links between income theory and monetary theory is to be found in the ratios of desires, money : other financial assets : reproducible physical assets. Changes in desired asset-liability relations lead to changes in the demand for goods and services largely through changes in the demand for reproducible fixed assets. Changes in the desired holdings of income-producing assets will be reflected in pressures that might lead to changes in their prices. Because reproducible fixed assets have a real cost of production, there are limits to their probable price movements. A rise in the demand for them can be satisfied without too much delay. A desire by the community to increase its holdings of physical reproducible assets can have effects on their supply, and consequently upon the national product and income. A decline in the demand for reproducible physical assets will lead to their not being renewed, while their

producers shift, insofar as possible, to other uses of their own resources. In this way, a decreasing desire to own these assets will have a depressing effect upon the national product and income.

Reproducible assets may be separated into Buildings and Equipment. In some respects, the changes in demands for equipment are likely to be reflected (and to be reflectable) more quickly in the market for goods and services than are changes in the demand for buildings.

Land and its improvements are largely nonreproducible, and changes in desires to hold land will affect its price primarily and have little or no effect on its supply. The price of land is the discounted present value of its expected perpetual income. There are no reasonable limits to the possible variation in this discounted value. Consequently, changes in the valuations placed on this type of asset must have their influence on other economic variables through their effect on the desires for other assets, or for liabilities, rather than directly through the factor markets.

In some respects, improvements to land approach the status of reproducible assets and thus differ slightly from land itself. Whether provision should be made for their specification in sector balance sheets is probably more a question of the availability than of the desirability of the data.

It should be emphasized that any proposal to include nonreproducible assets in a set of financial accounts must be limited strictly to the holdings that are entered in the balance sheets of economic units which are influenced by changes in their holdings. Thus the value placed on agricultural land owned by agricultural households is a significant economic fact. The value probably recorded for Snowdonia in the accounts of the U.K. National Trust is a purely nominal, if not fictional, entry. The values of undeveloped natural resources, which are sometimes considered to be part of national wealth, have no place in sector balance sheets.

Changes in consumption-producing assets have less significance than changes in income-producing assets. However, the effect of changes in the demand for housing in all countries, and for consumer durable goods in wealthy economies, has long been considered significant. Provision should be made for these assets in any complete set of sector balance sheets.

The analysis of liability accounts is essentially simpler than the analysis of asset accounts. All liabilities are financial. There are no problems in their measurement, similar to those that arise in the measurement of nonfinancial assets. To the debtor, the creditor's residence is not as significant as the reverse relation. A liability is a debt irrespective of its holder's nature. Consequently, no separate classifications

for foreign liabilities need be provided among the liabilities. Insofar as a country's international balance of indebtedness is significant, the liabilities to foreigners will be indicated in the asset accounts provided for foreigners.

The most important difference between different types of liability is that between the more important group of redeemable liabilities that envisage the surrender of real assets by the debtor at some future time, and the less important group of nonredeemable perpetual equities.

Some redeemable liabilities are repayable on demand at the option of the lender; others are redeemable at some predetermined time or during a predetermined period. In many respects, demand liabilities, other than money, have a liquidity disadvantage to the borrower that differentiates them from term liabilities. Demand liabilities may have to be met at short notice; repayment of term liabilities may be planned and provided for in the future.

Most of the banking system's liabilities are demand liabilities. Some quasi-monetary liabilities may differ superficially from monetary liabilities in that they technically are repayable on notice. In practice, this requirement of notice is only rarely enforced. A few securities are repayable on demand and consequently are liabilities more liquid than predetermined payments. In liability analysis, these securities resemble the most significant nonmonetary demand liabilities—loans. Demand loans arise in large part from trade credit that represents a financial lag between the transfer of ownership in goods and services and the final money payment arising from that transfer. While, on the borrower's side, trade credit may not have the involuntary aspects that it appears to have from the lender's point of view, its ancillary nature differentiates it, in the borrower's sight, from other demand loans that he may accept.

Some term liabilities represent a combined series of principal and interest payments that must be made for a predetermined period. Others represent a series of interest payments that end with the payment, at a predetermined date, of the principal value of the liability. There are three significant types of amortizable liability: securities, loans, and annuities. On the liability side, the distinction between amortizable liabilities that arise from installment credit and other liabilities is probably more significant for most modern wealthy economies than the associated classification of asset accounts. In size, however, the most significant amortizable liabilities are those arising from annuity contracts. Insofar as governments, charitable institutions, and even some businesses, other than life insurance companies, may have liabilities on account of life insurance contracts, even financial accounts that

provide for the presentation of separate accounts for the life insurance sector should also provide for the separate specification of life insurance liabilities owed by other sectors.

Fixed-term liabilities may be classified as either securities or loans. From a liquidity viewpoint, however, the term of a contract is probably more important than its nature. Relatively liquid assets must be accumulated to meet short-term liabilities, unless further borrowings may be obtained or the liabilities are to be defaulted. The acceptance of long-term liabilities permits the acquisition of illiquid assets. Hence, for the determination of asset-liability relations, security and loan liabilities should be analyzed in terms of their maturity.

Nonredeemable liabilities are, with few exceptions, equities in residual values. These may be represented by securities or by other less formal equity contracts. The only really significant difference is between those securities which bear a fixed yield, and thereby impose a fixed predetermined charge on the borrower's income, and those where the charge on the borrower's income is determined by the income itself and by the profit distribution policy agreed between the borrower and the lender.

Valuation of Balance Sheet Entries

Sector balance sheet accounts should serve more than one purpose. Consequently, the valuation problems to be faced in their compilation are more serious than they would be if single purpose accounts were envisaged. In the construction of income-expenditure and financing accounts, the problems of valuation are not serious. The use of current market prices follows from the principles upon which these accounts are based. While balance sheets are the historical end of a long series of transactions, they must measure stocks of assets and liabilities at a given instant if they are to be useful. Insofar as economic units attempt to maintain asset-liability ratios, they attempt to maintain relations between items at the values currently placed on them. That is, balance sheets that are intended to provide a series of data explaining the reactions of economic units should consist of items valued at current prices.

In the valuation of financial assets, it might appear that, because a financial asset is a liability, the sum of the values of all such assets except equities should equal the sum of all liabilities, and that the sum of equity values should be equal to the real wealth of the community.[26]

[26] This is the view of most writers on this subject. Thus, Stamp, in *Wealth and Taxable Capacity* (London, 1930), and *The National Capital and Other Statistical*

For financial analysis, however, this apparent truism is false. It is true that the sum of financing flows in any period must be nil (or the sum of domestic borrowings minus lendings must equal net borrowing from foreigners). Yet it does not follow that the sum of the values of assets as valued by their holders must be the same as the sum of the values of liabilities as valued by those who have accepted them. A holder of a marketable security may intend to sell it before its maturity date. If so, the eventual redemption value of the security will have only a remote significance to him; the only value that will be significant to him is its current market value. To the issuer, on the other hand, this value may have only a remote significance; he will value his liability at an amount directly related to his eventual obligation to redeem the security. While these two values are different, they are the values that are significant in the accounts of the asset holder and the liability acceptor. Hence, they are the values that should be recorded in financial accounts. This observation parallels the earlier statement that there is no fundamental reason why the financial asset and liability accounts should be mirror reflections of each other.[27]

The entries discussed in the preceding section may be grouped in the following categories: Monetary and Quasi-Monetary Items, Foreign Exchange, Marketable Domestic Securities, Nonmarketable Domestic Securities, Marketable Foreign Securities, Nonmarketable Foreign Securities, Annuities, Direct Loans, Other Financial Assets, Fixed Assets, Inventories, and Conceptual Assets. In certain respects, the problems to be faced in the valuation of assets are different for each of these groups. The problems are simplest for the monetary and quasi-monetary

Studies (London, 1937), used essentially the capitalized value of equity income as a measure of the national wealth. Hicks is specific on this point: "The balance-sheets of 'companies' and of 'government' must frankly be adjusted so as to maintain consistency with the personal sector. The shares and bonds, as they appear in the balance-sheet of the 'companies' sector, must be entered at the values which have been given them in the balance-sheet of the personal sector, not at the values given them by the companies. In spite of this, we must hold to the principle that the *net assets* of companies are nil. This means that we must not attempt to value the *real assets* of companies directly. We must accept the 'shareholders' value' of these real assets—not the value which is set upon them by the company, but the value which is implied in the market value of the shares" (*The Social Framework*, Oxford, 2nd ed., 1952, pp. 277–78). Goldsmith states that a set of sector balance sheets should be compiled so that "When all intergroup and intragroup relationships are eliminated we obtain instead of a combined national balance sheet a national wealth statement" (*A Study of Saving in the United States*, Princeton, 1955–56, Vol. III, p. 4). Edey and Peacock refer to differences in creditor and debtor valuations as ". . . inconsistencies [which] do, of course, occur, and we have to accept the fact that this is one of the aspects of life not susceptible of satisfactory treatment in accounts" (*National Income and Social Accounting*, London, 1954, p. 214).

[27] Page 186.

items. They are money values in themselves, and their valuation for balance sheet purposes raises no problems.

Foreign exchange is foreign money rather than domestic money. Its valuation in terms of foreign money raises no problems. The conversion of its value into domestic terms is entirely an exchange rate problem. In most cases, foreign exchange can be converted into national currency at a known exchange rate. In the absence of exchange controls, the valuation problem is simple. Even with exchange controls, balances are usually convertible even if the conversion must be made through unofficial channels. In compiling balance sheets for all sectors, the existence of unofficial markets must be recognized. Balances held by official national holders will usually be convertible at an official rate, and this rate may be used for their valuation. Balances held by private holders may, in some cases, be convertible only through unofficial markets, and the rates prevailing in these markets must be recognized in the valuation of private holdings.

Some of the remaining assets are marketable; others are not effectively marketable. The holders of marketable securities will be influenced by the market values when considering the amounts of these securities that they wish to hold, or when deciding to increase or decrease their holdings. It follows that financial accounts should provide for the recording of marketable securities at current market values.

The valuation of marketable foreign securities involves no problems significantly different from the valuation of marketable domestic securities, except that, in the construction of national financial accounts, it is the price of the security on national markets that is significant if this price differs from the price of the security on the home market. In most cases, however, the price of a foreign security on national markets will be equal to its price on foreign markets, converted at the rate of exchange effective for the conversion of proceeds from sales of securities.

The proposal that marketable securities be recorded in national balance sheets at their current market values differs from generally accepted accounting conventions. In most company balance sheets, securities are valued at cost or at the market price, whichever is the lower, or at cost plus amortized discount or minus amortized premium. When the market price is lower than cost, the first convention provides a market price valuation. When cost is less than the market price, or when the second convention is adopted, it is doubtful if asset holders are influenced solely, or even largely, by accounting valuations. Evidence in support of this view is provided by the common accounting practice of indicating the market value of securities as a memorandum

item when it differs from the conventional value included in the balance sheet total.[28]

The appropriate valuation of annuities is not simple. An annuity has four values: its cash surrender value, its current actuarial value, its accumulated cost, and its face value. The cash surrender or loan value of an annuity is a real value to its holder. It is a precise and realizable value that is of significance when measuring his short-term liquidity position. In any set of balance sheets designed to indicate liquidity, provision should be made in the asset accounts of annuity holders for recording the cash surrender values of annuities. At the same time, the cash surrender value is not the only value placed on an annuity. In most cases, the cash surrender value is considerably less than the capital "face value" of the annuity. Every purchaser of an annuity hopes eventually to obtain (or hopes that his heirs will obtain) a value at least equal to the face value. This is the value that measures the long-term protection against catastrophe that is provided by an annuity; consequently, this value has a place in the asset records. Presumably, an adequate set of asset accounts would provide two entries for an annuity: the cash surrender value and the difference between the cash surrender value and the face value. In some asset accounts, the current value of annuities is recorded.[29] This value is significant to the debtor on annuity contracts but not to the asset holder. The accumulated cost of an annuity is nothing more than an historical fact; in asset and liability accounts, it should be ignored on the principle that bygones are bygones. For measures of financing, however, the cost of annuities during the period probably is the significant measure.[30]

Since there are no markets for nonmarketable securities, direct loans, and other financial assets, there can be no market values for these assets. The only values that can be placed on them is their face, or money, values. Their identification in an asset schedule indicates that their real liquidity values may be less than the liquidity values of marketable securities that may be entered at lower money values.

Inventories are held either for sale or for consumption with the prospect of their complete or partial replacement by purchase. Both their potential realizable product and the opportunity cost of their replacement is determined by their market prices. Consequently, their

[28] See the balance sheet of the Staff Retirement Fund, in International Monetary Fund, *Annual Report of the Executive Directors for the Fiscal Year Ended April 30, 1959* (Washington, 1959), p. 215.

[29] E.g., the table, "Activos Líquidos de Empresas y Particulares," in the annual reports of the Bank of Mexico.

[30] E.g., the table, "Capital Account of the Personal Sector," in Central Statistical Office, *National Income and Expenditure* (London, annually).

current price value for balance sheet analysis is their current market price at the time of valuation.

Any valuation of fixed capital must be arbitrary. Two positive statements may be made. The market value of a fixed capital asset is likely to be different from its cost. It may be assumed that fixed capital assets would not be acquired unless their value to their holders would be at least equal to their cost. The complete combination of fixed assets of a business may have a market value considerably greater than their combined cost. Conversely, all of an economic unit's fixed assets, or any part of them, even if new, may well be salable only in "second-hand" markets at prices well below their original cost. To an owner who does not desire to sell all of his assets, or who would be unwilling, if they had to be replaced by new assets, to sell part of them second hand, their market value is irrelevant. Except when prices are rising rapidly and the sale of assets provides an opportunity for monetary capital gains, or when economic depression makes bankruptcy a quite possible fate, owners of fixed assets are unlikely to consider the market value of these assets. The value of fixed assets that is most likely to be decisive in determining the asset-liability decisions of economic units is the conventional accounting value placed on the assets. In most cases, this conventional accounting value is original cost less depreciation as computed by the accountants.[31]

The proposal that fixed assets be valued at original cost less conventional depreciation involves the acceptance of depreciation allowances as conventionally computed by accountants. This assumes that the depreciation allowances entered in their books are accepted by businessmen as the measures of asset depreciation that have an influence on their decisions, irrespective of the method used to compute the allowances. Measures of depreciation that are not consistent among individual economic units may be accepted as valid determinants of the values of fixed assets as viewed by their owners. If statisticians accept the hypothesis that owners of fixed assets value these assets and react to changes in their values in the way that economic units have always claimed to react, most of the problems regarding the computation of depreciation disappear for purposes of balance sheet analysis.

Conceptual assets are conceptual, i.e., they exist only as entries on the balance sheets. It therefore follows that their valuation in financial accounts should be the book values as recorded in balance sheets.

[31] The difference between the significance of fixed assets to financial businesses and to other businesses is reflected in the different accounting conventions normally used by the two groups. Fixed assets are of no significance to most financial businesses, and their acquisition is usually written off to current expenditure. Fixed assets are significant to other businesses, and the depreciation formulas they use lead to write-offs extending over a considerable number of years.

The valuation of liabilities does not raise problems comparable to those involved in the valuation of assets. Generally, liabilities are money values equal to the values obtained at the time they were incurred. The fact that some liabilities are bought and sold and have a market value is a fact of little relevance to a debtor. Even if liabilities are redeemable by purchase at less than their stated value, debtors are rarely in a position to benefit from this opportunity. They usually must provide for redemption by the maturity date of the liability. Consequently, in most cases, the effective value of a liability is its stated monetary value.

In some cases, the money value received in return for the acceptance of a liability is different from its stated value; it is then reasonable to assume that the difference between the two is equivalent to the capital value of the difference between the true interest cost of the liability and its stated yield. On this assumption, the appropriate value of the liability is its stated value minus that part of its discount or plus that part of its premium not amortized at the date of measurement.

Annuities are a special case where the measure of amortization is unique. The current actuarial value of an annuity is an irrelevant fact when considering the value of an annuity to its holder. It is, however, the relevant fact when measuring annuities from the viewpoint of the debtor. Consequently, financial accounts should provide, on the liabilities side, for the entry of annuities at their actuarial value.

Equities are surplus values; they should be recorded in the liability accounts at the values that equate both sides of the individual balance sheets of economic units. It should be noted that this valuation will not provide a measure of equities that will produce balance in the asset-liability accounts of the community as a whole. Insofar as the marketable values of marketable financial assets differ from their money values as liabilities, insofar as the cash surrender values are not closely related to the actuarial values of annuities, and insofar as the face values of annuities differ greatly from their actuarial values, the algebraic sum of financial assets and liabilities will not equal the values of nonfinancial assets and will not provide a converse measure of the real wealth of the community.

There is another, and perhaps more important, discrepancy in the accounts if they are measured in the manner proposed here. Changes in balance sheets will arise from three factors: transactions, changes in market values, and accounting adjustments. The financing entries in the sector accounts will reflect transactions only. Thus there will be a discrepancy between financing and balance sheet accounts. Probably, this discrepancy can be dealt with only by introducing a further set

of entries in the complete structure of accounts. These entries would provide for an analysis of changes in balance sheets arising from transactions and of changes arising from other factors. If the balance sheets are to be integrated with the income and expenditure accounts, a set of balance sheet accounts would presumably have to include the following data: balance at the end of the previous year; and, for the current year, changes arising from transactions, changes arising from other factors, and balance at the end of the year.[32] On this basis, capital gains and losses would be brought into the accounts at the time they arise; whether or not they are realized would be immaterial. This proposal is made on the assumption that capital gains and losses are effective determinants of economic action as soon as economic units become aware of their existence. The possibility of their realization will lead to shifting of assets and liabilities. The significant point is that it is their accrual, and not their realization, that produces incentives to financing actions.

Extent of Integration

At first thought it might seem desirable to envisage the development of a completely integrated set of income, expenditure, financing, and balance sheet accounts. This would involve a complete set of statements for each of the sectors identified above. However, the arguments for this approach are not as compelling as might appear at first.

The balance sheets of both the financial system and the government differ in significance from those of the other domestic sectors. These two sectors are independent in the sense that their income and expenditure decisions are not greatly influenced by their balance sheet relations. For the government, this independence is clear. Although individual banks more than any other institutions make decisions directly in the light of balance sheet criteria, the balance sheets for the banking system as a whole are determined essentially by the policy of the monetary authorities and by stable, known, liquidity criteria. Hence, changes in the balance sheets of the banks result from the decisions of the monetary authorities taken in the light of social policy aims rather than in the light of true balance sheet criteria. The balance sheets of other financial institutions are primarily reflections of the lending and

[32] This method of recording was first used by B. Korn, C. A. Oomens, and H. Rijken van Olst, of the Netherlands Central Bureau of Statistics, in the discussion of "Het verband tussen de nationale balans en het stelsel der nationale jaarrekeningen," *Statistiche en Econometrische Onderzoekingen*, Third Quarter, 1950.

borrowing decisions of the private sector rather than statements explaining income and expenditure decisions of financial institutions.

Changes in the balance sheets of the financial system and the government explain changes which are, in fact, forced on the balance sheets of the other sectors. (It is true that, to a certain extent, they also reflect changes initiated in the other sectors.) These changes in the balance sheets of the private sectors are forces leading to production, consumption, and investment decisions by the private sectors. Fully integrated accounts are really necessary for only these private sectors.

It follows that, while there may be arguments favoring fully integrated accounts for all sectors, any arguments based on the considerations outlined in this paper are not overwhelmingly strong. There are good arguments for a system of partial integration. A set of accounts that incorporates the income and expenditure transactions of the financial system in the accounts of the business sector, while presenting balance sheets for the financial sectors,[33] should be regarded as having a satisfactory degree of integration and identification. A set of accounts that incorporates the financial system completely in the accounts of the private sector should not be regarded as a set that provides a satisfactory degree of identification, even if the intrasector transactions or balances identify the relations of the nonfinancial sectors with the financial sectors.[34]

Technical Problems of Integration

Three important problems arise in integrating balance sheet accounts with other economic accounts. These are the problems arising from imputations, the timing of transactions, and split personalities.

National income accounts include a number of imputed transactions. The financial items in balance sheets must record acknowledged claims on, the obligations of, individual economic units. It has been argued that the presence of imputations in national income accounts makes the compilation of an alternative set of transactions accounts that are

[33] The French Ministry of Finance, in its "Rapport sur les comptes de la Nation" (published in *Statistiques et Etudes Financières*), the Canadian national transactions accounts (*Financing of Economic Activity in Canada,* a study prepared for the Royal Commission on Canada's Economic Prospects, Ottawa, 1959), and, presumably, the Norwegian accounts (see Statistisk Sentralbyrå, *Kredittmarked-statistikk, 1955*) include financing but not balance sheet accounts in this form.

[34] This is the form of the accounts for the Netherlands, Germany, Italy, and Sweden. It will be argued later in this paper that balance sheets of this form also provide an important source of statistical data for compiling the accounts of the private sectors.

limited to actual payments in money or credit an illuminating exercise.[35] There may be arguments for a set of accounts limited to transactions giving rise to payments as distinct from conventionally measured income and expenditure accounts. The need for the integration of income, expenditure, and balance sheet accounts is not such an argument, however. There can be no single entry imputation in national income and expenditure accounts.[36] For every imputed income entry, there must be an imputed expenditure entry. If the imputation relates to one economic unit only (e.g., imputed rent by a business), it may be recorded as an imputation on both sides of the unit's accounts with no effect on its net financing. If these imputed transactions for a single economic unit are recorded in different national income sector accounts, there are difficulties in integrating these transactions in a set of accounts involving one balance sheet only. However, this is an aspect of the split personality rather than of the imputation problem.

If the imputed transaction affects two economic units (e.g., the payment of wages in kind), there should be an imputed expenditure represented by the service provided by one sector and an imputed receipt by the same sector representing the imputed payment by the receiving sector, with countervailing entries in the other sector's accounts. This argument presumes that both sectors are aware of the imputations and may be considered as reacting to them. There are significant cases where only one sector is aware of an imputation. Taxes accrued, but not assessed, are the most important. An economic unit can estimate its accrued taxes and enter them as a liability that must be met. Until the unit's taxation return is received and recorded by the taxation office, the government cannot know the level of taxation accruals, and they should not be recorded in the government's balance sheet, if the balance sheet is to be a meaningful document. On the assumption that savings are measured net of accrued tax payments, an increase in taxes payable represents a borrowing from the government by the paying unit and hence a financing transaction for the paying unit. At the same time, it should not be considered a financing transaction for the receiving unit. Changes in dividend reserves may give rise to similar discrepancies between the balance sheets of the business and the household sectors. These are examples of proper discrepancies between balance sheets mentioned above. However, their effects differ from those of discrepancies arising from differing valuations of items. In all probability, the

[35] This is one of the Federal Reserve Board's arguments for the desirability of a complete set of flow-of-funds accounts separate from national income accounts (*op. cit.*, p. 7).

[36] See Central Statistical Office, *National Income Statistics: Sources and Methods* (London, 1956), p. 9.

best treatment for the discrepancies is that accorded to them by the U.K. Central Statistical Office in *National Income and Expenditure*, table on "The Financing of Investment," where they are, in fact, recorded as a discrepancy entry.

National income and expenditure accounts conventionally record transactions "when a sum of money, or the equivalent, becomes due and assignable,"[37] i.e., they include accrual items. It may be argued that balance sheets should record completed transactions and hence should exclude accruals. However, if provision is made in the accounts for trade credit and similar items, the question of accruals should raise no serious problems. The peculiar attributes of accruals account for the apparently anomalous treatment suggested above, where it was proposed that they should be considered closer to inventories in their economic significance than to other financial claims.[38] The only real problem with accruals arises when they are imputed accruals that are not recognized by one party to the transaction.

The split personality question is the most serious of the integration problems, and there may be no completely satisfactory solution for it. Insofar as national accounts involve significant allocations of income and expenditure by single units to the accounts of more than one sector, the purpose of constructing integrated accounts is frustrated. Formally correct accounts in which the financing transactions are reconciled may be constructed without much difficulty. Thus the net profit of self-employed income earners may be deducted from the savings of the business sector and added to the savings of the personal sector and the investment by self-employed persons, and investment in owner-occupied dwellings may be similarly transferred in the accounts. The resulting calculations of the financing balances of the business and personal sectors may then be reconciled with financing balances derived from balance sheet data for the business sector and the personal sector (including self-employed persons).[39] However, such an exercise does little more than calculate the net errors and omissions in the accounts. For the business sector, the balance sheet data will cover a smaller group of individual units than is, in fact, covered by the income and expenditure data. For the personal sector, the balance sheet data will cover a wider area than is covered by the income and expenditure data. Consequently, the asset-liability relations shown in the balance sheet data will describe the actions of groups different from those whose actions are described in the income and expenditure accounts. It thus be-

[37] See United Nations, *op. cit.*, p. 13.
[38] Page 191.
[39] This is the method adopted by the French Ministry of Finance (*op. cit.*).

comes impossible to derive meaningful conclusions from a combination of the two sets of data.

A formal integration may be achieved by first identifying the production accounts of identifiable subsectors (e.g., self-employed persons, government agencies) and then attempting to identify items in the balance sheet items of the full sectors that relate to the production transactions of the subsectors.[40] Formally, these accounts may be reconciled: the financing totals derived from the production accounts will be conceptually equal to the financing totals derived from the balance sheets. However, such a reconciliation must be a purely formal, noninformative exercise; it ignores the first principle enunciated in the introduction to this paper as explaining the actions of economic units.[41] To permit examination of the significant relations, the accounts of the subsectors would have to be recombined, that is, the subsectoring would have served no purpose from the viewpoint of integration.[42] The only informative approach to this problem would seem to involve a reorganization of the conventional income and expenditure accounts. Insofar as income and expenditure accounts are sector accounts, it would be desirable to have all the entries in the accounts of enterprises relating to the activities of self-employed persons and owner-occupiers of dwellings transferred to the account of the personal sector. The accounts of government enterprises as defined by the UN experts[43] might be transferred to the government account. Finally, a separate account should be established for public corporations. At the same time, the general government accounts should be separated into their component parts. If this were done in the income and expenditure accounts,[44] meaningful comparisons could be made with the forms of significant sector balance sheets that it should then be possible to compile.

In attempting to integrate balance sheet and income-expenditure accounts, the totals for the transactions categories should be kept consistent with accepted practices in the compilation of income and ex-

[40] This is the principle on which the U.S. flow-of-funds accounts are constructed. It is also, in essence, the principle underlying the treatment of this problem in the Canadian national transactions accounts.

[41] "Each economic unit regards the flow of liquid resources accruing to it as forming a single total for expenditure that is rationally allocated among different uses" (p. 170).

[42] This argument is directed solely to the integration problem. Significant information on the operation of the economy, additional to that provided by a comparison of income and expenditure accounts with balance sheets, may be provided by subsectoring the income and expenditure accounts. It is difficult to see what purpose would be served by subsectoring the balance sheets.

[43] I.e., excluding public corporations (*op. cit.*, p. 11).

[44] Insofar as the U.K. national income and expenditure accounts are sector accounts, they are, in fact, classified on these bases.

penditure accounts.[45] The income and expenditure accounts have proved a most useful addition to the body of economic statistics.[46] Economists are familiar with their content, significance, uses, and weaknesses. Integration of income and expenditure accounts with balance sheet accounts should not be an end in itself. An abandonment of national income accounts for some other form of statistical record is not a means toward integration justified by the objective of integration.

Compilation of Balance Sheets

Conceptually, financial accounts may be compiled in three ways. Balance sheet data and statements on sources and use of funds may be gathered for all economic units. Statements may be computed for some or all of the units on the basis of partial samples or similar surveys. Statements, or parts of them, may be computed for some units on the principle that every liability is an asset of another economic unit. The last two methods may be used in combination. Theoretically, the first of these alternatives is the most desirable. It is also completely impractical.[47]

In practice, one or both of the last two methods of compilation must be used to provide financial data. In most countries, balance sheets are available for the monetary system, and they should be available for the government. In many countries, statements are available for the life insurance sector.[48] It is possible to prepare balance sheets for the corporate business sector, but it is impossible to gather balance sheets for all households.

For the household sector and, given limitations on resources, frequently for the business sector, reliance must be placed on sample surveys and indirect compilations. For example, the liabilities reported by banks as due to businesses and households, if properly compiled, may be recorded as the assets of businesses and households; or production and sales data may be used as a source for estimates of changes in physical assets. In some cases, the available balance sheets of financial institutions do not contain data sufficiently adequate to provide the

[45] This is not the principle on which the U.S. flow-of-funds accounts are compiled (*op. cit.*, pp. 15–16).

[46] This sentence might well be classed as an understatement.

[47] This generalization is rash; in Yugoslavia and other Eastern European countries, financial accounts are compiled by analyzing all transactions passing through the banking system, and balance sheets are compiled or estimated for practically all economic units.

[48] *International Financial Statistics* contains life insurance statistics for 19 countries. Unfortunately, the data for many countries are in arrears.

information needed for the indirect compilation of balance sheets of partner sectors; therefore, the subclassification of known totals must be based on sample surveys. (For example, banks may report total deposit liabilities or total loans, but the classification of these totals into deposits held by, or loans made to, households and businesses must be made on the basis of data gathered from sample surveys.)[49]

An audited balance sheet is a true statement of what it purports to describe. Compilations that balance on both sides, without the use of residuals, are likely to be accurate descriptions of defined magnitudes. Sample surveys, at best, produce only approximations to the truth. Although recent advance in statistical techniques has done much to transpose sample surveys from the realm of fantasy to that of respectability, these surveys can never enter the "Kingdom of Unquestionable Accuracy." There are many cases where there is no practical alternative to the use of survey data. However, the inherent accuracy of balance sheets should make statisticians biased toward using them whenever possible.

These considerations lead to the conclusion that every effort should be made to persuade banks, insurance companies, other financial institutions, and governments to provide as much data as possible. Information that may not appear necessary for preparing adequate balance sheet data for these particular sectors may be invaluable for the indirect compilation of balance sheets for other sectors. It may be said that requests based on this argument impose an unreasonable burden on the original compilers of balance sheets. However, to compile data by surveys rather than indirectly from contra balance sheets involves in part the substitution of the survey team for the balance sheet accountant. Surveys are not cheap. From 1946 to 1957 the direct costs of the Federal Reserve Surveys of Consumer Finances (i.e., excluding the wage and other costs allocated to the general budget of the Board of Governors) averaged approximately $170,000 a year, and in one year (1956) exceeded $450,000.[50]

There is one point where a program based on the extension of monetary statistics would require a change in banking statistics. At present, data on the monetary system's liabilities to, and its claims on, the private sector only rarely distinguish between accounts relating to the business and household sectors.[51] The best classification that is obtain-

[49] However, see below for a comment on the presently available data of this type.

[50] Board of Governors of the Federal Reserve System, *Annual Reports*.

[51] *International Financial Statistics* is able to attempt a separation of monetary data relating to the business sector from those relating to the household sector only for Canada, the United States, and Yugoslavia. Fragmentary data are available for France and the Union of South Africa.

able in practically all cases combines these data in a set of accounts that distinguishes only the domestic private sector. As indicated in the Appendix to this paper, even where supplementary data provide further classifications of loans and deposits, these classifications are usually based on the business of the borrower, or depositor, or the purpose of the loan, without a clear distinction between the household and the business sectors, and they usually include data relating to self-employed households in the same categories with data relating to business.

The absence of data on the liabilities of governments is the most striking hiatus at present.[52] A program undertaken by central banks and statistical offices for the development of national financial statistics should, in many countries, start with an analysis of the accounts of the central government.

It follows that a program for the compilation of financial accounts for all sectors of the economy can best be conceived as a program for the improvement of monetary statistics, for their extension to include the statistics of financial institutions other than banks, and for the improvement of statistics on government finance. If this program were wedded to a program for the collection of data on the physical wealth of the community, an adequate, and reliable, set of balance sheets for all sectors of the economy should emerge.

Conclusion

This paper proposes that a program for the construction of national financial accounts should envisage the compilation of a series of balance sheets for each of the important economic sectors, with the items classified by liquidity and valued at current prices. In order that this system of national financial accounts might be properly integrated with a system of national income, expenditure, and financing accounts, changes in the balance sheet entries should be identified as changes arising from transactions, or as changes arising from alterations in market values and accounting adjustments.

A program for the compilation of financial accounts could be developed along several lines. Given the availability, and the relatively high reliability, of data provided by financial institutions and of the data to be found in the accounts of governments, it follows that a program for the compilation of financial accounts should be, in large

[52] *International Financial Statistics* is able to present financial accounts of the government for only 30 countries, and in many of these, the data are deficient in many respects.

part, a program for the development of the statistics relating to banks, other financial institutions, and governments. It might well be considered as a program with two parts:

1. The improvement of monetary statistics, and the development of comparable statistics for other financial institutions and governments;
2. The compilation of data on the community's physical capital.

In most countries, the experience of the national monetary authorities should provide the basis for the first part of this program and the experience of statistical offices should provide the basis for the second part. In a large number of countries, the complete program might well be conceived as a cooperative venture, with the central bank, or other monetary authority, compiling the data developed from financial records and the central statistical office, or similar institution, compiling the data developed from records of physical assets.

APPENDIX

The Classification of Bank Deposits and Loans

In at least four countries, bank deposits held by the private sector of the economy are classified by type of holder. In only one of these four (the United States) is this classification fully comparable with the structure of economic sectors outlined in this paper, in that the holdings of noncorporate businesses are separated from those of corporations and other individuals. In one country (Japan), the holdings of corporations are separated from noncorporate holdings; in the other two (Ceylon and India), all business holdings, further classified by type of business, are separated from personal holdings, but business holdings are defined to include the deposits of self-employed households.

Bank loans to the private sector are classified by borrower or purpose in at least 26 countries. In 13 countries,[53] the classification is according to the purpose of the loan without identifying the type of borrower. In 12 countries,[54] the classification separates business from personal borrowings; the types of business are identified, and loans to self-employed households are included in business. In only one country (the United States) are loans classified by those to the corporate business, the noncorporate business, and the consumer sectors.

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[53] Argentina, Burma, Ceylon, Colombia, Costa Rica, the Dominican Republic, Ecuador, Greece, Guatemala, Honduras, Nicaragua, Paraguay, and Peru.

[54] Brazil, Canada, Germany, India, Ireland, Italy, Japan, Korea, New Zealand, Pakistan, the Philippines, and the United Kingdom.

A Monetary Budget

Harold M. Knight*

THE DRAWING UP OF BALANCE SHEETS for the monetary system[1] has received increasing attention in many countries during the past few years. These balance sheets are particularly useful in helping to make short-term projections—which might be described as Monetary Budgets—that will indicate the monetary developments likely to accompany probable future fiscal and balance of payments experiences. The purpose of this paper is to illustrate, by reference to a hypothetical example, the practical usefulness of such a projection.

The illustration proceeds by means of tables arranged in balance sheet form. The figures have no relation to the data of any actual country; they are no more than materials with which to demonstrate methods of working. It should also be said that the example has been simplified, and that many of the problems that exist in such work in real life have been omitted, in order to keep the illustration from becoming too lengthy. The main elements needed in an exercise of this kind are patience and arithmetic.

For the purpose of the exercise, we imagine that we are in the Research Department of a Central Bank, and that we have been instructed to examine the monetary prospects for the coming fiscal year, say 1958–59, giving special attention to the measures needed to end the domestic price inflation that has been a constant source of trouble in the past few years. The low level of international reserves has also caused continual concern and has led to the erection of a complex structure of strict controls on international trade. It is hoped that the establishment of domestic price stability may be a first step toward easing and eliminating the restraints on trade. At the moment, the level of unemployment gives no particular cause for concern.

The first step is to review the performance of the banking system in the past few years, and for this purpose Tables IA, IB, and IC are

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This paper is an English version of one of a series of introductory lectures originally given in Spanish to a group of central bank technicians at the Center for Latin American Monetary Studies, Mexico City, in May 1958.

[1] A large number of sets of such balance sheets, simplified, rearranged, and relabeled, are published regularly in the group, "Monetary Survey," on the country pages in *International Financial Statistics.*

prepared. These show the consolidated accounts of the banking system as a whole, arranged in a simple form that is suited to monetary analysis (Table IA), the accounts of the Central Bank (Table IB), and the consolidated accounts of the commercial banks (Table IC).

Table IA shows a rapid growth in Money throughout the recent years: it multiplied almost 17 times between the end of 1952 and the end of 1957. This is clearly the dominant monetary fact in the economy

TABLE IA. CONSOLIDATED BALANCE SHEET OF THE BANKING SYSTEM

(*Data as of end of period*)

	1952	1953	1954	1955	1956	1957
Foreign Assets	—	1	13	15	22	39
Claims on Government	52	87	170	405	758	823
Claims on Private Sector	23	56	160	224	378	710
Total Assets	75	144	343	644	1,158	1,572
Money	73	143	303	581	935	1,209
Quasi-Money	1	3	24	39	70	142
Government Deposits	1	1	4	14	126	143
Net Other	—	–3	12	10	27	78
Total Liabilities	75	144	343	644	1,158	1,572

in the period studied. The rate of growth of Money from 1956 to 1957 (about 30 per cent) was smaller than in the earlier years shown; nevertheless, it was much more substantial than was warranted by any increase in the community's need for money, and it was accompanied by a substantial rise in the domestic price indices during 1957.

The major causes of the increase in Money were rapid increases in the banking system's credits to the Government and to the private sector. The greater part of the increase in bank assets between 1952 and 1956 was due to the rapid rise of Claims on Government, but in 1957 the government sector reduced sharply its demands on the banking system for credit, and it even preserved unspent in its deposit accounts some of the funds newly borrowed during the year.

The reduction in 1957 in the net use by the Government of bank funds was not accompanied by a fall in the use of credit by the private sector. Claims on Private Sector increased at a sharper rate than in most previous years and were the major factor contributing to the rise in Money in 1957.

The remaining facts to note are the slight influence of the foreign sector in the domestic monetary expansion (this perhaps somewhat

unreal assumption is made for the sake of simplicity) and the rise in Quasi-Money (probably more rapid in the example than might be expected in reality), which to a small extent absorbed some of the expansive influence of the increase in the system's assets.

In this preliminary review of the system's past performance, attention is next directed to the separate balance sheets of the Central Bank (Table IB) and the commercial banks (Table IC). These tables

TABLE IB. BALANCE SHEET OF THE CENTRAL BANK

(Data as of end of period)

	1952	1953	1954	1955	1956	1957
Foreign Assets	—	1	13	15	22	39
Claims on Government	49	74	135	389	731	770
Claims on Private Sector	3	2	7	4	7	4
Claims on Banks	8	38	115	102	162	350
Other Assets	3	5	25	20	27	51
Total Assets	63	120	295	530	949	1,214
Notes						
Held by Private Sector	55	98	225	406	611	761
Held by Banks	1	3	6	11	13	24
Deposits						
Banks	5	15	32	59	152	259
Government	1	1	4	14	126	143
Other Liabilities	1	3	28	40	47	27
Total Liabilities	63	120	295	530	949	1,214

TABLE IC. CONSOLIDATED BALANCE SHEET OF THE COMMERCIAL BANKS

(Data as of end of period)

	1952	1953	1954	1955	1956	1957
Cash	6	18	38	70	165	283
Notes	*1*	*3*	*6*	*11*	*13*	*24*
Deposits at Central Bank	*5*	*15*	*32*	*59*	*152*	*259*
Claims on Government	3	13	35	16	27	53
Claims on Private Sector	20	54	153	220	371	706
Other Assets	1	6	16	22	32	48
Total Assets	30	91	242	328	595	1,090
Private Deposits						
Checking	18	45	78	175	324	448
Time and Savings	1	3	24	39	70	142
Credit from Central Bank	9	37	113	101	162	350
Other Liabilities	2	6	27	13	39	150
Total Liabilities	30	91	242	328	595	1,090

show clearly that the economy is one that uses more banknotes than checking deposits; the ratio varies from year to year, with a generally downward trend in the example given here, but Notes Held by Private Sector have in most years been rather more than double the amount of the private sector's Checking Deposits. If this kind of ratio continues to apply, any further expansion by the commercial banks, if not accompanied by a continued expansion in the accounts of the Central Bank, will involve the banks in a heavy leakage of cash in the form of withdrawals of banknotes.

There has in fact been a rapid expansion in the accounts of the Central Bank over the years recorded. For the most part this has resulted from the Bank's acquisition of government debt, but in 1956 and 1957 there were sharp increases in the Central Bank's Claims on Banks. As shown in Table IC, the commercial banks hold almost no government debt.

The main factor of expansion in the accounts of the commercial banks has been the growth of their Claims on Private Sector. Although the amounts they hold on deposit with the Central Bank have also grown rapidly, this growth reflects mainly the introduction during 1956 of a system of minimum reserve requirements. A required reserve ratio of 35 per cent against demand and time deposits was imposed at the end of 1956. The imposition of a higher reserve ratio, 40 per cent, at the end of 1957 increased total required reserves by 98, i.e., from 35 per cent of 394 (138) to 40 per cent of 590 (236).[2] The banks did not check the expansion of their Claims on Private Sector following the introduction of minimum reserve requirements; with this new pressure on their available resources, they financed their needs by means of borrowings and rediscounts at the Central Bank. This appears in the liability entry, Credit from Central Bank.

The next step is to begin collecting data on expectations for the year that lies ahead. We may assume that we are now at the end of February 1958; the Government's budget for the next fiscal year, which is usually presented publicly in April, is now being prepared for fiscal 1958–59. The Research Department at the Central Bank is in close contact with the Budget Office at the Treasury and is able to obtain estimates of revenues and expenditures for the year ending March 31, 1959. From this, and with data for previous years as a base, the

[2] The effects of changes in required reserve ratios may be conveniently presented in tabular form as follows:

End of Year	Demand and Time Deposits	Required Ratio	Required Reserves	Actual Reserves	Excess
1956	394	35%	138	152	14
1957	590	40%	236	259	23

Research Department makes an estimate of what the actual cash income and outgo of the Government will be in the fiscal year 1958–59, and hence of the cash shortfall (deficit) that will need to be financed from various sources in that period. The data are presented in the form shown in Table IIA, which compares the cash operations of the

TABLE IIA. DRAFT GOVERNMENT BUDGET, FISCAL YEARS[1]

	1956–57 Actual	1957–58 Actual	1958–59 First Proposal	1958–59 Second Proposal
Cash Revenue				
Income Tax	227	326	337	350
Customs Duties	198	315	251	280
Other	75	153	137	195
Total	499	794	725	825
Cash Expenditure				
Services and Net Loss on Public Enterprises	261	292	374	325
Public Works	230	276	328	270
War Ministry	197	215	244	215
Other	57	67	79	70
Total	745	850	1,025	880
Deficit (–) or Surplus	–246	–56	–300	–55
Financing				
Credit from Banking System	353	65	180	0
Use of Deposit Balances	–112	–17	110	45
Bonds Sold to Public	5	8	10	10

[1] Converted to cash basis—i.e., shows amounts spent and (for 1958–59) expected to be spent, and amounts received and (for 1958–59) expected to be received.

Government in the fiscal years 1956–57 and 1957–58 with the data that are estimated to be implicit in the draft government budget that is being prepared.

The cash deficit to be financed during the year is estimated at 300. To meet this deficit, 10 of bonds may be placed outside the banking system. But since no foreign borrowing is contemplated, the amount of financing to be provided from the banking system is 290. The officials in the Budget Office are of the opinion that, if in fact there is such a cash deficit, it would be financed in the first place by drawing down the Government's existing deposit balances to their lowest convenient working level—to, say, about 30; the remainder of the financing required could come only from the purchase of government debt by the

banking system. At this point, inquiries in the Budget Office are suspended for a day or so.

Meanwhile, the Research Department has been active in two other fields—prospects for the balance of payments and the commercial banks. A rough sketch of the likely balance of payments for 1958 has been made, and present information indicates that its monetary effects in the coming year are likely to be neutral (Table IIB) and that no significant change is likely in the Central Bank's holdings of reserves.

TABLE IIB. ESTIMATED BALANCE OF PAYMENTS

(*In millions of U.S. dollars*)

	1955 Actual	1956 Actual	1957 Actual	1958 Estimated
Goods and Services				
Exports	162	195	184	190
Imports	–152	–187	–185	–185
Other (net)	–8	–5	–3	–3
Balance	2	3	–4	2
Capital				
Official and Banks	1	–2	–1	—
Other	–3	–1	5	–2
Balance	–2	–3	4	–2

In addition, conversations have been held with commercial bankers and with businessmen to test the outlook of lenders and borrowers for the coming year. In this field, data in the form of figures are extremely difficult to acquire; however, from last year's experience and the best information that can be gathered concerning this year's expectations, a figure of 350 is chosen as the amount of the increase in banks' Claims on Private Sector that may be expected during 1958, unless conditions change.

The first trial Monetary Budget can now be prepared (Tables IIIA, IIIB, and IIIC). The successive steps whereby the projections are constructed may be summarized as follows:

A. Steps leading from Table IA to Table IIIA

1. *Foreign Assets.* With exports stable and imports controlled, no change is expected.
2. *Claims on Government.* The government budget as drafted implies an increase of 180 in Claims on Government by the banking system.

TABLE IIIA. PROJECTED CONSOLIDATED BALANCE SHEET OF THE BANKING SYSTEM: FIRST TRIAL

(Data as of end of period)

	1957 Actual	Change	1958 Projected
Foreign Assets	39	0	39
Claims on Government	823	+180	1,003
Claims on Private Sector	710	+350	1,060
Other Assets	99	+10	109
Total Assets	1,671	+540	2,211
Money	1,209	+577	1,786
Quasi-Money	142	+68	210
Government Deposits	143	-110	33
Other Liabilities	177	+5	182
Total Liabilities	1,671	+540	2,211

3. *Claims on Private Sector.* The banks' ideas indicate that, if conditions remain unchanged, credit by the banks to the private sector will rise by 350, i.e., to 1,060.
4. *Other Assets.* An increase of 10 is estimated.
5. *Government Deposits.* The government budget as drafted implies a reduction of, say, 110.
6. *Other Liabilities.* An increase of 5 is estimated.
7. *Money* and *Quasi-Money.* If a balance is to be maintained, Money and Quasi-Money together must rise by the sum of the changes projected in steps 1 through 6, i.e., by (180+350+10)−(5–110), or 645. If it is assumed that the ratio of money to Quasi-Money will remain constant, Money will increase by $\frac{1209}{1351} \times 645$, or 577, and Quasi-Money by $\frac{142}{1351} \times 645$, or 68.

B. Steps leading from Table IB to Table IIIB and from Table IC to Table IIIC

1. *Foreign Assets.* No change is expected.
2. *Claims on Government.* It is estimated that the banks will absorb 12 of the newly issued bonds, leaving 168 (180−12) for the Central Bank.
3. *Claims on Private Sector.* No change is expected for the Central Bank, but an increase of 350 is estimated for the commercial banks.
4. *Other Assets.* Increases of 5 for both the Central Bank and the commercial banks are estimated.

TABLE IIIB. PROJECTED BALANCE SHEET OF THE CENTRAL BANK: FIRST TRIAL

(Data as of end of period)

	1957 Actual	Change	1958 Projected
Foreign Assets	39	0	39
Claims on Government	770	+168	938
Claims on Private Sector	4	0	4
Claims on Banks	350	+179	529
Other Assets	51	+5	56
Total Assets	1,214	+352	1,566
Notes			
Held by Private Sector	761	+363	1,124
Held by Banks	24	+6	30
Deposits			
Banks	259	+90	349
Government	143	-110	33
Other Liabilities	27	+3	30
Total Liabilities	1,214	+352	1,566

TABLE IIIC. PROJECTED CONSOLIDATED BALANCE SHEET OF THE COMMERCIAL BANKS: FIRST TRIAL

(Data as of end of period)

	1957 Actual	Change	1958 Projected
Cash	283	+96	379
Notes	*24*	*+6*	*30*
Deposits at Central Bank	*259*	*+90*	*349*
Claims on Government	53	+12	65
Claims on Private Sector	706	+350	1,056
Other Assets	48	+5	53
Total Assets	1,090	+463	1,553
Private Deposits			
Checking	448	+214	662
Time and Savings	142	+68	210
Credit from Central Bank	350	+179	529
Other Liabilities	150	+2	152
Total Liabilities	1,090	+463	1,553

5. *Notes Held by Private Sector* and *Private Checking Deposits.* If it is assumed that the ratio of Notes to Checking Deposits remains constant, the increase in Money, estimated in Table IIIA at 577, will be divided between these two categories as follows: Notes will rise by $\frac{761}{1209} \times 577$, or 363, and Checking Deposits by $\frac{448}{1209} \times 577$, or 214.
6. *Other Liabilities.* Increases of 3 for the Central Bank and 2 for the commercial banks are estimated.
7. The remaining items (after entering the changes in Government Deposits and Time and Savings Deposits) relate to the accounts of the Central Bank with the commercial banks. The net of the changes in the Central Bank balance sheet items, Claims on Banks, Notes Held by Banks, and Deposits of Banks, will be equal to the algebraic sum of changes in all its other balance sheet entries, i.e., $(363-110+3)-(168+5)=83$. This is also equal to the net of changes in the commercial bank balance sheet items, Cash and Credit from Central Bank.
8. If the required reserve ratio of 40 per cent is maintained, commercial banks must hold at the Central Bank deposits of 40 per cent of $(662+210)$, i.e., 349, which is 90 more than their Central Bank deposits at the end of 1957. Assume that Notes Held by Banks increase by 6. The total increase in Cash is then $90+6$, or 96.
9. To maintain equilibrium in the balance sheets, the total increase in Credit from Central Bank must be 83 (see step 7) plus 96 (see step 8), i.e., 179.

The first comment to make on the trial Monetary Budget is that it is grossly unbalanced. The situation at the time requires that, in the interest of stability, there should be no change (or at most a small increase) in Money during the year. However, the assumptions on which the Monetary Budget has been built (all representing fairly firm plans that are likely, if the Central Bank fails to call attention to their implications, to be carried out) imply that if such plans are implemented the community's Money will rise by about 50 per cent over the year.

The Central Bank, therefore, needs to direct its attention to recalculating the Monetary Budget in a way that will indicate the kinds of change in existing plans which are necessary in order to make them consistent with monetary stability. Since the two major factors of disequilibrium are the planned government cash deficit and the expected increase in Claims on Private Sector, the Bank's efforts must be applied toward reducing these factors.

The steps in the examination of the problem of balancing the Monetary Budget might be something like the following:

C. Selection of policies by entering acceptable projections for 1958 in Table IVA

1. Enter the original estimates for Foreign Assets and Other Assets.
2. Enter Money with the assumed maximum acceptable increase for the year, say, 5 per cent.

TABLE IVA. PROJECTED CONSOLIDATED BALANCE SHEET OF THE BANKING SYSTEM: SECOND TRIAL

(*Data as of end of period*)

	1957 Actual	Change	1958 Projected
Foreign Assets	39	0	39
Claims on Government	823	0	823
Claims on Private Sector	710	+46	756
Other Assets	99	+10	109
Total Assets	1,671	+56	1,727
Money	1,209	+60	1,269
Quasi-Money	142	+36	178
Government Deposits	143	−45	98
Other Liabilities	177	+5	182
Total Liabilities	1,671	+56	1,727

3. Assume the increase in Quasi-Money to be half the increase recorded in the previous year, i.e., 36.
4. Enter the original estimate of Other Liabilities.
5. The total of increases in Claims on Government plus increases in Claims on Private Sector minus increases in Government Deposits must then equal (60+36+5)−10, or 91.
6. This amount has to be distributed between the contributions of the banking system to financing the government deficit and to increasing its Claims on Private Sector; the performances of past years and the positions at the beginning of the year may be regarded as justifying an approximately equal division between these two. Claims on Private Sector would be allowed to increase by 46, while bank financing of the government deficit, 45, could be made effective by reducing existing Government Deposits.

D. Calculation of interbank accounts and selection of reserve ratio and rediscount policies

1. Transfer the data on Foreign Assets, Claims on Government, Claims on Private Sector, Other Assets, Time and Savings Deposits, and Other Liabilities from Table IVA to Tables IVB and IVC.

TABLE IVB. PROJECTED BALANCE SHEET OF THE CENTRAL BANK: SECOND TRIAL

(*Data as of end of period*)

	1957 Actual	Change	1958 Projected
Foreign Assets	39	0	39
Claims on Government	770	0	770
Claims on Private Sector	4	0	4
Claims on Banks	350	+14	364
Other Assets	51	+5	56
Total Assets	1,214	+19	1,233
Notes			
Held by Private Sector	761	+38	799
Held by Banks	24	0	24
Deposits			
Banks	259	+23	282
Government	143	-45	98
Other Liabilities	27	+3	30
Total Liabilities	1,214	+19	1,233

TABLE IVC. PROJECTED CONSOLIDATED BALANCE SHEET OF THE COMMERCIAL BANKS: SECOND TRIAL

(*Data as of end of period*)

	1957 Actual	Change	1958 Projected
Cash	283	+23	306
Notes	*24*	*0*	*24*
Deposits at Central Bank	*259*	*+23*	*282*
Claims on Government	53	0	53
Claims on Private Sector	706	+46	752
Other Assets	48	+5	53
Total Assets	1,090	+74	1,164
Private Deposits			
Checking	448	+22	470
Time and Savings	142	+36	178
Credit from Central Bank	350	+14	364
Other Liabilities	150	+2	152
Total Liabilities	1,090	+74	1,164

2. Assume the increase in Money to be distributed between Notes and Checking Deposits in the same proportions as the initial balances. Notes will then rise by $\frac{761}{1209} \times 60$, or 38, and Checking Deposits by $\frac{448}{1209} \times 60$, or 22.
3. If the minimum required reserve ratio of 40 per cent is maintained, and the volume of excess reserves is not changed, Deposits at Central Bank will have to be increased by 40 per cent of (36+22), i.e., 23, to 282.
4. Assume no change in Notes Held by Banks.
5. The required increase in Credit from Central Bank is (23+46+5)−(22+36+2), or 14.

The results of the further activities of the Central Bank's Research Department are not so conveniently presented in tabular form, but the steps might be something like the following:

6. On reviewing the events of the fiscal year 1957–58, the Central Bank might conclude that the banks had gone too deeply into its debt, and decide that it would like to establish a new situation where banks would owe it less but where the cost of their marginal borrowing would be higher.

   A plan to achieve this purpose might provide that the required reserve ratio would be reduced in one substantial step; that banks would then be told that they were expected to use the funds released by the reduction to repay part of their debt to the Central Bank; and that fresh rediscounts beyond the lower level thus established would be at a sharply increased cost.

   Suppose that after full examination some such plan is adopted, and it is desired to reduce Claims on Banks to 300 by the end of the year, i.e., to 64 less than in Table IVB. This means a corresponding reduction of 64 in Deposits at Central Bank, from 282 to 218. To make this possible, and with allowance for 20 in excess deposits, the required reserve ratio should be reduced to, say, 30 per cent $\left(\frac{200}{470+178} \times 100 = \text{about } 31 \text{ per cent}\right)$. The increased rediscount rates, applied perhaps to marginal borrowings, could be designed to impose substantial profit penalties on banks that overexpanded their loans. A suitable alternative program on these lines (not shown in Table IVC) could be worked out for presentation to the banks.

7. Two major policy presentations could then be prepared, one for the Government and one for the commercial banks, designed to put into effect the revised Monetary Budget:

   a. Present Table IIIA, and possibly Tables IIIB and IIIC, to the Government. Indicate the consequences of the changes implied in present plans. Present Table IVA and suggest a review of the draft government budget to ensure the stability of the currency (see the last column of Table IIA). Assure the Government that the steps necessary to carry out the reduction in private sector credit will be taken by the Central Bank, but that the plan can succeed only if the Government does its part. Work with the Budget Office toward preparing an alternative Table IIA.

   b. Present Tables IIIA and IVA to a meeting of general managers of commercial banks. Ask for a virtual halt to expansion of credit to the private sector. Present details of proposed action on discount rates and reserve ratios. Indicate that, because of penal marginal rediscount rates, severe profit disadvantages will confront any individual bank which expands loans to the private sector.

From the foregoing, the type of calculation involved in making a Monetary Budget will be evident. However, some further points deserve mention:

1. The development of the actual balance sheets of the monetary system and its components needs to be watched carefully each month throughout the period under review—with due account taken of the normal pattern of seasonal changes—in order to check that the outcome of the operations of the year will be reasonably in accord with the Monetary Budget. If not, further adjustment to the policy action may be required.

2. Developments in other areas linked to monetary policy need to be kept under careful scrutiny for any changes in, for example, export volume, export prices, or other balance of payments elements; the velocity of circulation of bank deposits; the level of international reserves; and the level of employment. Any substantial changes evident in the statistics may call for adjustment of the original policy.

3. It is most unlikely that the actual figures at the end of 1958 will in fact be very close to the projected figures. However, the setting of a reasonable objective for the increase in Money, the adaptation of this objective to changing circumstances, reasonable continuity in the efforts of the Central Bank to achieve this objective, and the expression of the Central Bank's ideas in terms of balance sheet projec-

tions, are likely to lead to far better monetary policy than would emerge in the absence of such conscious guidance of the system.

4. The foregoing discussion avoids dealing with the extent to which policy changes that alter the expected level of domestic credit from the banking system to the private and government sectors will have secondary effects on the balance of payments. It has long been known that loose policies in relation to domestic credit weaken the balance of payments, whereas tight domestic credit policy can work toward balance of payments strength, but only recently has a beginning been made in forging tools that may make possible quantitative estimates in this field.[3]

5. The usefulness, as a guide to policy, of calculations such as those set out above depends upon having available, frequently and currently, the sources on which they are based—i.e., (a) time series of complete balance sheets, grouped to show the accounts of the relevant sectors of the economy, for each subgroup of banks (Central Bank, commercial banks, etc.) and (b) government finance accounts on a cash basis. The balance sheets of banks are normally obtainable in suitable form with negligible cost and effort. Although the construction of suitable government finance accounts on a cash basis does not, in principle, present difficulties, many countries have not, in practice, given this work the attention that it merits.

[3] See J. J. Polak, "Monetary Analysis of Income Formation and Payments Problems," *Staff Papers*, Vol. VI (1957–58), pp. 1–50.

The Relation Between Long-Term and Short-Term Interest Rates in the United States

Richard Goode and Eugene A. Birnbaum *

THE MORE ACTIVE MONETARY POLICY that has been pursued in the United States in recent years has resulted not only in fluctuations in the general level of interest rates but also in sharp changes in the relation between long-term and short-term rates. The spread between long-term and short-term rates was greatly narrowed during the period of rising interest rates which extended from the second half of 1954 to late 1957. Whereas for many years the yield on long-term bonds had usually exceeded rates for treasury bills and commercial paper by a considerable margin, the spread between the average yield on high-grade corporate bonds (Moody's Aaa) and the average rate for prime commercial paper (4–6 months) diminished to only 0.05 percentage point in 1956 and 0.08 percentage point in the first ten months of 1957. With several reductions in the Federal Reserve Banks' discount rates in November 1957 and the early months of 1958, interest rates fell rapidly. As usual, the decrease was greater for short-term rates than for long-term rates, and by June 1958 the spread between the yields on corporate bonds and commercial paper widened to 1.03 percentage points. Thereafter interest rates rose. Yields on long-term bonds soon approached their 1957 highs, but commercial paper rates remained well below their 1957 level. In the first quarter of 1959, the spread was 0.83 percentage point. The differential between yields on long-term and short-term government securities showed similar but even wider fluctuations.

During the period of almost 25 years prior to 1956–57, a substantial excess of long-term interest rates over short-term rates had come to be regarded as normal by many persons. One explanation advanced for the differential is that long-term lenders have to be offered a premium to protect them against the risk that interest rates will rise in the

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future, thereby causing holders of long-term securities to suffer capital losses and to miss opportunities for higher yields. Coupling this view of the usual relationship between long-term and short-term rates with the widely held theory that the long-term rate at any time reflects mainly an average of expected future short-term interest rates, J. R. Hicks concluded: "If short rates are not expected to change, the long rate will exceed the short rate by a normal risk-premium; if the current short rate is regarded as abnormally low, the long rate will be decidedly above it; the short rate can only exceed the long rate if the current short rate is regarded as abnormally high."[1] On this basis, the narrowing of the differential between long-term and short-term rates in 1956–57 might be interpreted as an indication that the market considered the high short-term rates of those years temporary. By similar reasoning, the continuance of a considerable spread when rates rose in late 1958 and early 1959 might be taken as evidence that lenders were becoming accustomed to higher interest rates and were beginning to expect them to continue.

In a longer historical perspective, however, a spread between long-term and short-term interest rates as narrow as that of 1956–57 is by no means unusual. Prior to 1930, short-term interest rates were often equal to, or higher than, long-term rates. Short-term rates fluctuated over the business cycle much more than long-term rates, usually rising above long-term rates in boom periods and falling below long-term rates at the trough of the business cycle. The difference between the periods before and after 1930 suggests the possibility that the persistent excess of long-term rates in the later period was attributable to special factors, such as the great depression, war finance, and easy money policies, and that, if more flexible monetary policies are followed in the future, the behavior of the term structure of interest rates may resemble more closely that of the period before 1930 than that of the last 25 years.

In this paper, no attempt will be made to test various hypotheses with respect to the normal relation between long-term and short-term interest rates or to account for the apparent change in that relation after about 1930. The paper is confined to a review of statistics of long-term and short-term interest rates in the United States for the past century. Some general observations on the relationship between

[1] J. R. Hicks, *Value and Capital* (Oxford, 2nd ed., 1946), p. 147. Friedrich Lutz, who also considers the long rate a reflection of expected short rates, believes that yields will be approximately equal for different maturities if no change in short rates is expected. See Friedrich A. Lutz, "The Structure of Interest Rates," *The Quarterly Journal of Economics*, Vol. LV (1940–41), pp. 36-63, reprinted in American Economic Association, *Readings in the Theory of Income Distribution* (1946), pp. 499–529.

long-term and short-term rates are presented in Section I; the cyclical variability of the relationship is examined in more detail in Section II; and the Appendix contains information on data and methods for measuring cyclical variations in interest rates.

I. General Observations on the Relationship

In comparing long-term and short-term interest rates, it is desirable to use rates on obligations that are actively traded in open financial markets and that are subject to a minimum risk of default. It is also desirable that the rates be free from the influence of extraneous features, such as tax exemption, convertibility provisions, call provisions, and special rediscount facilities.

For a record of interest rates in the United States for a long period of time, it is necessary to use statistics of yields on private bonds and other debt instruments rather than on government securities. State and local bonds have been tax exempt, and federal securities were partially or wholly tax exempt until 1941. U.S. Treasury bonds, moreover, have had note issue and special discount privileges at various times, which may have affected their yields. In any case, satisfactory statistics of yields to maturity on federal bonds and short-term securities are not available for the years before 1920. Although private securities are subject to a somewhat greater risk of default than government securities and hence may be expected to have higher yields, this element can be minimized by selecting quotations for the highest grade bonds and other types of paper.

Long-term bond yields and commercial paper rates

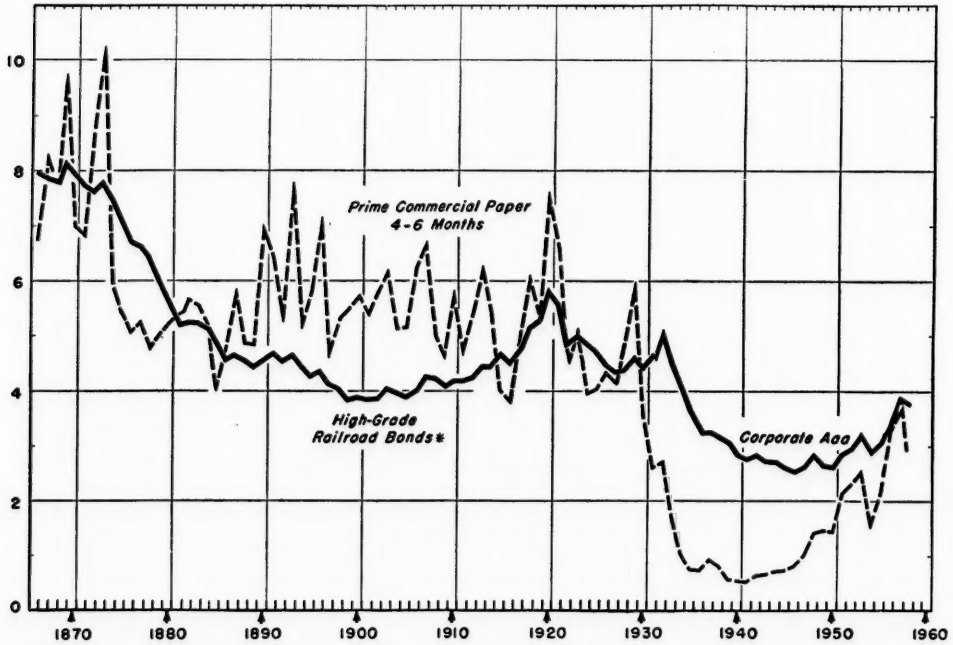
The changing nature of the relationship between long-term and short-term interest rates is brought out by Chart 1, covering the years 1866–1958. Long-term rates are represented by Macaulay's (unadjusted) series on yields on high-grade railroad bonds, 1866–1930,[2] and by Moody's composite series for Aaa bonds, 1931–58. The short-term rates are open market rates for 4–6 month prime commercial paper in New York City.[3]

[2] Frederick R. Macaulay, *The Movements of Interest Rates, Bond Yields and Stock Prices in the United States Since 1856* (National Bureau of Economic Research, New York, 1938), pp. A141-61.

[3] Data for the earlier years are from Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics* (Washington, November 1943); those for the more recent years are from *Federal Reserve Bulletins*.

CHART 1. ANNUAL AVERAGES OF LONG-TERM AND SHORT-TERM INTEREST RATES IN THE UNITED STATES, 1866–1958[1]

(In per cent per annum)



[1] Reproduced, with permission of Board of Governors of Federal Reserve System, from *Federal Reserve Chart Book on Financial and Business Statistics,* Historical Supplement, September 1959, p. 37.

* National Bureau of Economic Research.

Before 1930, the annual average rates on prime commercial paper exceeded railroad bond yields more often than not. The late 1870's and the middle 1920's are the only periods in which commercial paper rates were lower than long-term bond yields for several consecutive years. The tendency for short-term rates to exceed long-term rates is especially noticeable in the period of almost three decades from the middle of the 1880's to the outbreak of World War I and the beginning of operations of the Federal Reserve Banks (November 1914). The fact that commercial paper was rediscountable at the Federal Reserve Banks after 1914 increased its liquidity and may have tended to lower commercial paper rates relative to bond yields in that period.[4]

Since 1929, commercial paper rates have always been lower than high-grade bond yields (annual averages), and by a wide margin until recent years. Commercial paper rates and other short-term rates fell, with only minor interruptions, throughout the 1930's; high-grade bond yields dipped in 1930, rose somewhat in 1931–32, and declined thereafter. The fall in prime commercial paper rates from 1929 to 1939, however, was three times the decline in the average yields of Moody's Aaa corporate bonds (5.26 percentage points compared with 1.72 percentage points). The decline in short-term rates was no doubt associated with the increasing liquidity of the commercial banks, attributable mainly to Federal Reserve open market operations in 1930–33 and to a large inflow of gold in 1934–39.[5]

In the 1940's, the level and pattern of interest rates were dominated largely by the wartime and early postwar activities of the Treasury and the Federal Reserve authorities. A wide spread between long-term and short-term rates was preserved during the war. This spread narrowed considerably after the war, even during the period of active Federal Reserve intervention, which ended with the Treasury–Federal Reserve "accord" of 1951.[6] In the 1956–57 period of tight money, the spread almost disappeared.

[4] Rediscounting occurred among commercial banks before the establishment of the Federal Reserve System but was likely to become expensive and difficult in times of monetary stringency.

[5] Federal Reserve Banks' holdings of U.S. Government securities increased from $0.5 billion at the end of 1929 to $2.4 billion at the end of 1933, but remained approximately stable in the years 1934–39. The gold stock, which was $4.0 billion at the end of 1929 and again at the end of 1933, rose to $17.6 billion by the end of 1939. See *Banking and Monetary Statistics* (cited above), pp. 375–77.

[6] For details of the policies of the U.S. Treasury and the Federal Reserve Board with respect to interest rates from 1939 to 1951, see Henry C. Murphy, *The National Debt in War and Transition* (New York, Toronto, and London, 1950), and U.S. Congress, Joint Committee on the Economic Report, *Monetary Policy and the Management of the Public Debt: Replies to Questions and Other Materials for the Use of the Subcommittee on General Credit Control and Debt Management* (82nd Cong., 2nd Sess., Washington, 1952), Vol. 1, pp. 50–76 and 346–68.

Although the annual averages smooth out some of the fluctuations, it is clear from Chart 1 that commercial paper rates, and to a lesser extent long-term bond yields, have shown a high degree of variability in certain periods. This variability will be examined in more detail in Section II.

Bond yields by term to maturity

Another set of data covering a fairly long period of time is Durand's series on "basic yields" on corporate bonds classified by term to maturity, 1900–57.[7] Basic yields are defined as "*the yield of highest grade* [*corporate*] *bonds free from extraneous influences*, bonds that are non-convertible, non-callable, fully taxable, actively traded, free from manipulation, etc."[8] A useful feature of this series is the detailed classification of issues by term to maturity, which permits Durand to draw yield curves covering a range of maturities from less than 1 year to 60 years or more. Two limitations of the data may be noted: (1) the yield figures are less reliable for bonds close to maturity, especially those within 1 year or less of maturity, than for bonds with more distant maturities;[9] and (2) the determination of the freehand yield curves is to some extent a matter of judgment on which opinions may differ. Durand's smooth curves, moreover, do not allow for possible humps or dips which should occur if middle-term yields lie outside the range of short-term and long-term yields.

Durand's series and yield curves indicate that prior to 1930 it was by no means unusual for short-term and medium-term interest rates to be higher than long-term rates. In fact, for only 2 of the first 30 years of the century (1916 and 1925) does Durand's yield curve have a generally ascending slope, i.e., indicate that yields rose with the term to maturity.[10] For half the years the curve is descending, indicating that yields tended to be lower for long and medium terms to maturity than for short terms. For a number of years the curve is flat, and for some years its slope is uncertain although apparently flat over the greater part of its range. From 1930 through 1957 the yield curve is clearly ascending in 24 years; it is flat in 1 year and uncertain, but apparently

[7] David Durand, *Basic Yields of Corporate Bonds, 1900–1942* (National Bureau of Economic Research, Technical Paper 3, New York, 1942); David Durand and Willis J. Winn, *Basic Yields of Bonds, 1926–1947: Their Measurement and Pattern* (National Bureau of Economic Research, Technical Paper 6, New York, 1947); National Industrial Conference Board, *The Economic Almanac, 1958* (New York, 1958), p. 85.

[8] David Durand, *op. cit.*, p. 4.

[9] *Ibid.*, pp. 12–14.

[10] Both 1916 and 1925 were years of cyclical expansion of general business activity.

flat over a considerable range, in 3 years. There is no year in this period for which the curve indicates higher yields for short maturities than for long maturities.

The characteristics of Durand's yield curves may be summarized as follows:

	1900–29	1930–57
Flat	9 years (1901–05, 1917, 1926–28)	1 year (1930)
Descending	15 years (1909–15, 1918–24, 1929)	0
Ascending	2 years (1916, 1925)	24 years (1931, 1933–51, 1953–56)
Uncertain	4 years (1900, 1906–08)[11]	3 years (1932, 1953, 1957)[12]
Total	30	28

Yield curves for U.S. Treasury securities are published monthly in the *Treasury Bulletin*. For the period from the end of World War II to 1956, the yield curves maintain a generally ascending form, with varying degrees of slope and often a tendency to flatten out for longer maturities. In 1956, there was a pronounced tendency for the yield curves to be flat for most maturities, but to rise for maturities of up to about 2 or 3 years. In 1957, when interest rates were higher than they had been for many years, there were indications of a "hump" in the yield curve for a maturity of about 1 to 2 years, with the curve ascending sharply for shorter maturities and descending gently for longer maturities. With the decline in interest rates in late 1957 and early 1958, the yield curve had by mid-1958 resumed an ascending form for maturities up to 20 years.

II. Cyclical Variability of the Relationship

Up to the early 1930's the relationship between long-term and short-term interest rates in the United States appears to have been highly sensitive to the general business cycle. Short-term rates were usually low relative to long-term rates at the trough of the business cycle and high relative to long-term rates at the peak of the cycle. This tendency is not evident for the late 1930's or the war and immediate postwar period, but it seems to have been resumed more recently. The following discussion examines separately the evidence for the periods 1858–1933 and 1933–58.

[11] All of these curves are flat for the longer maturities (generally maturities longer than about 5 or 6 years); their shape for the shorter maturities is uncertain, but there is some indication that the curves may be descending in this range.

[12] For 1932, the curve is flat for maturities longer than about 8 years, and uncertain for shorter maturities but possibly ascending; for 1952 and 1957, it is flat up to 10 and 20 years, respectively, and ascending thereafter.

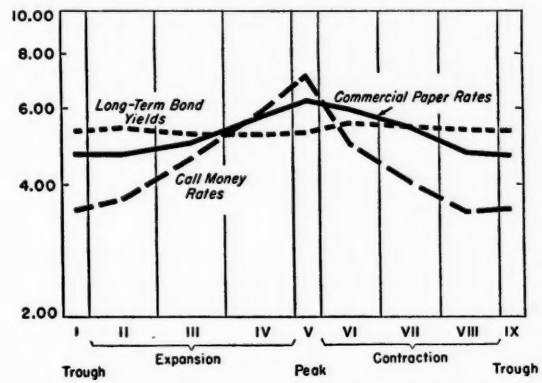
PERIOD 1858–1933

Until the 1930's, short-term interest rates showed a strong tendency to move in the same direction as general business activity, usually being substantially lower at the trough of the business cycle than at the peak. Long-term interest rates displayed much less cyclical sensitivity; they varied less than short-term rates over the cycle, and their cyclical rise typically began at a later stage of expansion and continued well past the peak of the business cycle.[13]

In Chart 2, the cyclical pattern, 1858–1933, is summarized by curves

CHART 2. AVERAGE CYCLICAL PATTERN OF LONG-TERM AND SHORT-TERM INTEREST RATES IN THE UNITED STATES, 1858–1933[1]

(In per cent per annum; logarithmic vertical scale)



[1] Weighted average of monthly rates for each step of 19 business cycles during the period; see Appendix, Table 1. The average monthly rate or yield during each of the 9 reference cycle stages is plotted at the midpoint of the cycle stage. The horizontal axis represents the duration, in months, of the cycle stages.

showing commercial paper rates, call money rates at the New York Stock Exchange, and yields of high-grade long-term bonds during each stage of 19 business cycles as identified by the National Bureau of Eco-

[13] See Chart 2 and also Wesley C. Mitchell, *What Happens During Business Cycles* (National Bureau of Economic Research, New York, 1951), p. 167. Mitchell presents measures of the timing and amplitude of cyclical changes of open market rates for call money, commercial paper, and 90-day time money and of yields of railroad bonds, New England municipal bonds, and high-grade corporate and municipal bonds.

nomic Research.[14] On the average, over these 19 cycles the rise and fall of commercial paper rates and call money rates corresponded to the expansion and contraction of general business activity, and both series of short-term rates reached their maximum at the peak of the business cycle. The rise of commercial paper rates, however, began at a later stage than that of call money rates; and after the cyclical peak, commercial paper declined much less abruptly. On the average, short-term rates were higher than long-term bond yields in the last stage of expansion and the first stage of contraction as well as at the peak of business activity. The chart shows clearly the lag of changes in bond yields behind movements in general business activity and in short-term interest rates. The average bond yield was slightly lower at the peak of the business cycle than during the initial and terminal troughs.[15]

The averaging of interest rates over the stages of 19 business cycles conceals wide differences in the range of variability as well as irregularities in the timing of movements in individual cycles. Such differences can be seen from the statistics for individual cycles presented in Table 2 in the Appendix. The peaks of call money rates and commercial paper rates shown in Chart 2 are influenced significantly by the unusually high short-term interest rates at the peak of the 1870–79 cycle, which included the panic of 1873.[16] If this cycle were omitted from the derivation of the average cyclical pattern, the peaks of the two short-term rate series would be lower but the same general pattern would exist.

The movement of short-term rates was greater and appears to have conformed somewhat more closely to the business cycle in the period before the beginning of operations of the Federal Reserve System than in later years (see the average patterns for 14 cycles, 1858–1915, and 5 cycles, 1914–33, Table 1 in the Appendix).

In all of the 19 cycles from 1858 to 1933, one or both of the short-term interest rates exceeded long-term bond yields at some stage, most often at or near the peak. On the other hand, there were only two cycles—1888–91 and 1919–21—in which commercial paper rates exceeded long-term bond yields at all stages, and in none of the cycles were call money rates higher than long-term bond yields throughout the cycle (Table 2 in the Appendix).

[14] See Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (National Bureau of Economic Research, New York, 1946).

[15] See Appendix for additional information.

[16] At the cyclical peak in 1873, the average call money rate is computed to be 28.51 per cent and the average commercial paper rate 15.09 per cent. The average peaks for the other 18 cycles, 1858–1933, are only 5.89 per cent and 5.77 per cent, respectively. The average peaks for the 19 cycles are 7.08 per cent and 6.26 per cent, respectively.

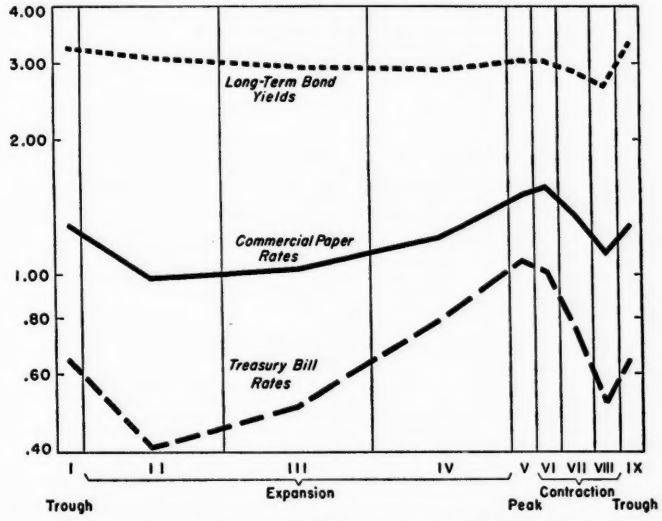
PERIOD 1933–58

In the 1933–38 cycle, interest rates showed little cyclical sensitivity but tended to decline over the whole cycle. During World War II and the immediate postwar years, both the pattern of interest rates and general business cycle movements were dominated by special influences. More recently, there are indications that the earlier cyclical behavior of long-term and short-term rates may be reappearing, although short-term rates have generally remained below long-term rates.

The average pattern of rates for 4 business cycles, 1933–54, is shown in Chart 3. For that period, treasury bill rates rather than call money

CHART 3. AVERAGE CYCLICAL PATTERN OF LONG-TERM AND SHORT-TERM INTEREST RATES IN THE UNITED STATES, 1933–54[1]

(In per cent per annum; logarithmic vertical scale)



[1] Weighted average of monthly rates for each stage of 4 business cycles during the period; see Appendix, Table 1. The average monthly rate or yield during each of the 9 reference cycle stages is plotted at the midpoint of the cycle stage. The horizontal axis represents the duration, in months, of the cycle stages.

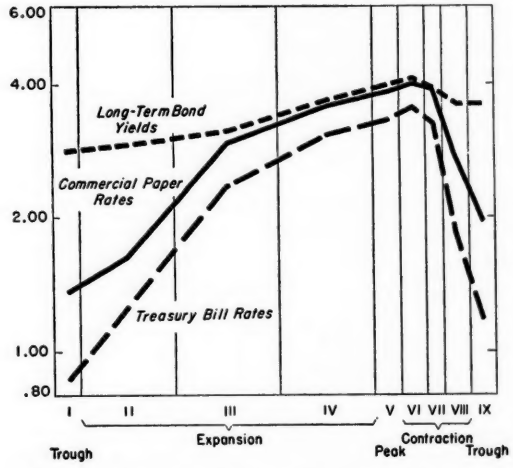
rates are taken as the second measure of short-term interest rates. The average pattern for these cycles shows that the short-term rates reached their peak at or near the peak of general business activity, but

it also indicates a secondary peak in short-term rates at the trough of the business cycle. The average, however, is heavily influenced by the relatively high rates prevailing during the initial trough of the 1933–38 cycle. Long-term bond yields, on the average, do not show a clear cyclical pattern, but examination of the statistics for individual cycles, given in the Appendix, reveals that long-term rates conformed fairly well to the general pattern in the two postwar cycles, 1945–49 and 1949–54.

The pattern of rates for the 1954–58 cycle, based on tentative datings of the peak (July 1957) and terminal trough (April 1958), is shown by Chart 4. Although the profile of interest rates over this cycle differs

CHART 4. PATTERN OF LONG-TERM AND SHORT-TERM INTEREST RATES IN THE UNITED STATES, 1954–58[1]

(In per cent per annum; logarithmic vertical scale)



[1] For data, see Appendix, Table 2. The average monthly rate or yield during each of the 9 reference cycle stages is plotted at the midpoint of the cycle stage. The horizontal axis represents the duration, in months, of the cycle stages.

considerably from the average for the 19 cycles, 1858–1933, the cyclical character of the relationship between long-term and short-term rates is much more noticeable than in the 4 cycles, 1933–54.

APPENDIX

Data and Methods for Measuring Cyclical Variations in Long-Term and Short-Term Interest Rates, 1858–1958

Cycle dates and stages

The dates for the various phases of 24 business cycles in the United States for the period 1858–1958 are those of the "reference cycles" compiled by the National Bureau of Economic Research.[17] The dating of the 1954–58 cycle is tentative. Each cycle is divided into nine phases or stages. Stages I, V, and IX are each of three months' duration and represent, respectively, the initial trough, peak, and terminal trough of the reference cycle. The intervening period between the initial trough and the peak and the period between the peak and the terminal trough are each divided into three stages of nearly equal duration for an individual cycle. Stages II, III, and IV are the periods of expansion, and stages VI, VII, and VIII are periods of cyclical contraction. The terminal trough, stage IX, of each cycle covers the same three months as the initial trough of the next cycle. Furthermore, the first and third months of troughs and peaks are also included in the adjacent cycle stages.

Interest rate series

Short-term interest rates are represented by rates for call money, commercial paper, and treasury bills; long-term rates are represented by yields on high-grade corporate bonds.

Short-term rates

The call money rates are for renewal loans at the New York Stock Exchange. The commercial paper rates are open market rates in New York City for choice 60–90 day paper, 1858–1923, and for 4–6 month prime paper, 1924–58. The call money rates are from Macaulay;[18] commercial paper rates are from Macaulay for the period 1858–1936 and from the Federal Reserve Board[19] for 1937–58. Treasury bill rates are for new issues of 3-month bills.

Call money rates and commercial paper rates were subject to considerable seasonal influence, especially in the period before the establishment of the Federal Reserve System. The effect of this characteristic, however, is reduced by the averaging and weighting procedure employed in this paper. An advantage of call money rates for present purposes is that the qualities of call loans probably changed less over the period 1858–1933 than those of other short-term paper. Commercial paper became rediscountable at the Federal Reserve Banks with the establishment of the System. Prior to that time, bankers' acceptances could not be held by national banks but were held by private, i.e., state-chartered, banks. Call loans and other paper for the purpose of financing speculative and investment transactions are not rediscountable at the Federal Reserve Banks. During most of the period under study in this paper, call money rates and commercial paper rates were probably the most important short-term rates in the open market. Treasury

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[17] Arthur F. Burns and Wesley C. Mitchell, *op. cit.*, and a private communication from the National Bureau of Economic Research to the authors of this paper.

[18] Frederick R. Macaulay, *op. cit.*, pp. A141–61.

[19] *Banking and Monetary Statistics* (cited above), p. 451, and *Federal Reserve Bulletins.*

bills, which were first issued in 1929, became the most important type of short-term paper by the mid-1930's; and in recent years their volume has greatly exceeded that of other short-term paper, as shown by the following tabulation.[20] (In this tabulation, brokers' loans, which are assumed to consist predominantly of call loans, are taken as representative of call money at the New York Stock Exchange.)

	1920–23	1924–29	1930–33	1934–38	1950–58
	(Averages of end-of-year figures; in millions of U.S. dollars)				
Brokers' loans	1,428	4,008	1,041	942	....
Commercial paper	774	536	167	204	1,942[21]
Bankers' acceptances	....	1,074	1,001	385	770
Treasury bills	—	—	587	1,964	21,800[22]

Long-term rates

The long-term rates are Macaulay's unadjusted series of yields on high-grade U.S. railroad bonds, 1858–1930,[23] and yields of Moody's Aaa (highest grade) corporate bonds, 1931–58.[24] Macaulay's study provides the only readily available information on bond yields in the earlier part of the period. During most of the years to 1930, railroad bonds were outstanding in greater volume and enjoyed a higher credit rating than other corporation bonds. Since Macaulay's series ends with January 1937, it was necessary to use another series for the years 1937–58 at least. However, in view of the deterioration of the economic position of the railroad industry in the 1930's, it was considered advisable to switch from the Macaulay series to Moody's Aaa corporate bonds beginning with 1931.[25]

Macaulay's series on railroad bond yields represents a chain index, expressed in terms of percentage yields, in which the groups of bonds comprising the index were modified in January of each year. With a few exceptions, the bonds had maturities of ten years or more. In some periods, especially in the early years, Macaulay's chain-link procedure produces a yield figure that is considerably higher than the averages of actual yield quotations of the bonds included in the index. For example, the index for January 1860 is 8.92 per cent, whereas the actual average of yields of the bonds used for that month is only 7.48 per cent.

Macaulay's study also includes a series on railroad bond yields adjusted for "economic drift." The adjustment is intended to remove the effect of secular and cyclical changes in the quality of the bonds attributable to changes in the financial condition of the railway industry. Month-to-month movements of the adjusted data are almost identical with movements of the unadjusted data. The drift adjustment, however, does affect the absolute level of the yields. Over the whole period 1858–1937 for which the two series are available, the unadjusted series exceeds the adjusted series by an average differential of about $\frac{8}{10}$ per cent. The adjustment is substantially larger than this in the earlier years and smaller in the later years, especially in the late 1920's.[26]

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[20] Statistics for 1920–38 from *Banking and Monetary Statistics* (cited above), pp. 465–67, 494, and 509–10; statistics for 1950–58 from *Federal Reserve Bulletins*.
[21] Including finance company paper. [22] Rounded to nearest $100 million.
[23] Frederick R. Macaulay, *op. cit.*, pp. A141–61. [24] *Banking and Monetary Statistics* (cited above), pp. 470–71, and *Federal Reserve Bulletins*. [25] The average of the Macaulay series is 4.41 per cent in 1930 and 4.65 per cent in 1931. The average of the Moody series is 4.55 per cent in 1930 and 4.58 per cent in 1931. After 1931, the Macaulay series tends to exceed the Moody series by a wider margin.
[26] The average of monthly bond yield quotations for the unadjusted series in 1860 is 8.591 per cent, compared with 6.040 per cent for the adjusted series, i.e., a differential of 2.551 per cent. By 1930, the average differential amounted to only 0.517 per cent. Yields indicated in the unadjusted series at all times exceed corresponding figures of the adjusted series.

For this paper, the unadjusted series was considered preferable for three reasons. First, no adjustment for economic drift is available for short-term rates, although the average quality of commercial paper tended to improve over the period covered. Second, it is not obvious that the smaller secular decline in long-term interest rates shown by the adjusted series gives a more accurate picture of the movement of representative interest rates in the light of capital supply and demand. Third, the nature and appropriateness of Macaulay's adjustment are not entirely clear to us.

Derivation of cyclical patterns

In deriving the pattern of interest rates for each business cycle, monthly figures on call money rates (or treasury bill rates), commercial paper rates, and bond yields were averaged for each of the nine stages of the cycle. For the average cyclical patterns, the rate in each phase was weighted by the duration, in months, of the phase in order to avoid giving disproportionate weight to sharp fluctuations of brief duration.

Table 1. Average Cyclical Patterns of Call Money Rates (or Treasury Bill Rates), Commercial Paper Rates, and Long-Term Bond Yields During Stages of NBER Reference Cycles, 1858–1954

(*In per cent per annum*)

		Call Money Rates (Renewal Loans) or Treasury Bill Rates[1]	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
19 Cycles, 1858–1933 (weighted averages)[4]				
Trough	I	3.59	4.84	5.44
Expansion	II	3.74	4.71	5.49
"	III	4.59	5.00	5.25
"	IV	5.90	5.75	5.21
Peak	V	7.08	6.26	5.30
Contraction	VI	5.00	6.00	5.53
"	VII	4.08	5.46	5.46
"	VIII	3.45	4.85	5.37
Trough	IX	3.48	4.72	5.22
14 Cycles, 1858–1915 (weighted averages)[4]				
Trough	I	3.41	4.88	5.63
Expansion	II	3.81	4.94	5.76
"	III	4.74	5.26	5.47
"	IV	6.14	5.98	5.33
Peak	V	7.24	6.53	5.39
Contraction	VI	4.95	6.29	5.73
"	VII	4.17	5.78	5.64
"	VIII	3.43	5.06	5.48
Trough	IX	3.38	4.88	5.33

TABLE 1 (*concluded*). AVERAGE CYCLICAL PATTERNS OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1954

(*In per cent per annum*)

		Call Money Rates (Renewal Loans) or Treasury Bill Rates[1]	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
5 Cycles, 1914–33 (weighted averages)[4]				
Trough	I	4.11	4.75	4.91
Expansion	II	3.53	4.06	4.74
"	III	4.18	4.28	4.66
"	IV	5.20	5.11	4.87
Peak	V	6.63	5.52	5.03
Contraction	VI	5.15	5.03	4.89
"	VII	3.78	4.33	4.82
"	VIII	3.52	4.12	5.01
Trough	IX	3.76	4.28	4.91
4 Cycles, 1933–54 (weighted averages)[4]				
Trough	I	.646	1.30	3.28
Expansion	II	.414	.99	3.14
"	III	.510	1.03	2.99
"	IV	.791	1.22	2.93
Peak	V	1.072	1.52	3.03
Contraction	VI	1.010	1.58	3.02
"	VII	.756	1.39	2.90
"	VIII	.519	1.13	2.69
Trough	IX	.585	1.08	2.83

Sources: For a description of the sources and the reference cycles, see the text of this Appendix.

[1] Call money rates for the first three cyclical patterns (1858–1933, 1858–1915, and 1914–33); treasury bill rates for the last cyclical pattern (1933–54). Call money rates are for renewal loans at the New York Stock Exchange; treasury bill rates are for new issues of 3-month bills.

[2] Choice 60–90 day paper for 1858–1923; 4–6 month prime paper for 1924–54.

[3] High-grade U.S. railroad bonds for 1858–1930; Moody's Aaa corporate bonds for 1931–54.

[4] The weighting used is described in the Appendix, final section, Derivation of Cyclical Patterns.

TABLE 2. AVERAGES OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1958

(In per cent per annum)

Reference Cycles and Stages[1]		Cycle Periods: Initial month	Cycle Periods: Terminal month	Call Money Rates (Renewal Loans) or Treasury Bill Rates	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
Cycle 1, 1858–61				*Call Money*[4]		
Trough	I	Nov 1858	Jan 1859	4.12	4.64	8.78
Expansion	II	Jan 1859	Jul 1859	5.11	5.79	8.88
"	III	Aug 1859	Feb 1860	6.00	6.91	8.93
"	IV	Mar 1860	Sep 1860	5.46	5.90	8.45
Peak	V	Sep 1860	Nov 1860	6.79	8.30	8.45
Contraction	VI	Nov 1860	Dec 1860	7.19	12.00	8.92
"	VII	Jan 1861	Mar 1861	5.67	7.13	8.69
"	VIII	Apr 1861	May 1861	5.69	7.15	8.90
Cycle 2, 1861–68						
Trough	I	May 1861	Jul 1861	5.75	6.70	9.00
Expansion	II	Jul 1861	Sep 1862	5.41	5.83	8.27
"	III	Oct 1862	Dec 1863	6.08	5.50	6.43
"	IV	Jan 1864	Mar 1865	6.61	7.59	6.04
Peak	V	Mar 1865	May 1865	6.00	8.23	7.53
Contraction	VI	May 1865	Feb 1866	5.99	7.40	7.88
"	VII	Mar 1866	Jan 1867	5.30	6.28	7.90
"	VIII	Feb 1867	Nov 1867	6.14	7.26	7.86
Cycle 3, 1867–71						
Trough	I	Nov 1867	Jan 1868	6.46	7.85	7.93
Expansion	II	Jan 1868	Jun 1868	6.70	6.93	7.76
"	III	Jul 1868	Nov 1868	7.77	7.46	7.80
"	IV	Dec 1868	May 1869	9.28	8.56	8.06
Peak	V	May 1869	Jul 1869	13.40	9.24	8.04
Contraction	VI	Jul 1869	Dec 1869	9.26	10.54	8.20
"	VII	Jan 1870	May 1870	5.41	7.49	7.99
"	VIII	Jun 1870	Nov 1870	5.04	6.80	7.86
Cycle 4, 1870–79						
Trough	I	Nov 1870	Jan 1871	7.81	7.74	7.92
Expansion	II	Jan 1871	Nov 1871	5.13	6.71	7.78
"	III	Dec 1871	Oct 1872	7.55	8.28	7.59
"	IV	Nov 1872	Sep 1873	15.13	9.58	7.66
Peak	V	Sep 1873	Nov 1873	28.51	15.09	8.02
Contraction	VI	Nov 1873	Jul 1875	3.75	6.25	7.45
"	VII	Aug 1875	May 1877	3.41	5.21	6.74
"	VIII	Jun 1877	Feb 1879	4.07	5.00	6.46
Cycle 5, 1879–85						
Trough	I	Feb 1879	Apr 1879	3.99	4.77	6.08
Expansion	II	Apr 1879	Mar 1880	5.97	5.31	5.90
"	III	Apr 1880	Feb 1881	5.65	5.20	5.48
"	IV	Mar 1881	Feb 1882	4.86	5.23	5.20
Peak	V	Feb 1882	Apr 1882	4.40	5.39	5.27
Contraction	VI	Apr 1882	Mar 1883	5.15	5.70	5.23
"	VII	Apr 1883	Apr 1884	2.55	5.32	5.18
"	VIII	May 1884	Apr 1885	2.83	5.09	5.13

TABLE 2 (*continued*). AVERAGES OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1958

(*In per cent per annum*)

Reference Cycles and Stages[1]		Cycle Periods: Initial month	Cycle Periods: Terminal month	Call Money Rates (Renewal Loans) or Treasury Bill Rates	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
Cycle 6, 1885–88				*Call Money*[4]		
Trough	I	Apr 1885	Jun 1885	1.33	3.73	4.94
Expansion	II	Jun 1885	Dec 1885	1.88	3.92	4.81
"	III	Jan 1886	Jul 1886	2.53	4.03	4.55
"	IV	Aug 1886	Feb 1887	5.48	5.61	4.56
Peak	V	Feb 1887	Apr 1887	4.91	5.18	4.59
Contraction	VI	Apr 1887	Jul 1887	5.80	5.48	4.60
"	VII	Aug 1887	Nov 1887	4.77	6.36	4.73
"	VIII	Dec 1887	Mar 1888	3.54	5.42	4.65
Cycle 7, 1888–91						
Trough	I	Mar 1888	May 1888	2.39	5.15	4.63
Expansion	II	May 1888	Jan 1889	2.41	4.69	4.56
"	III	Feb 1889	Sep 1889	3.38	4.45	4.40
"	IV	Oct 1889	Jun 1890	5.95	5.46	4.48
Peak	V	Jun 1890	Aug 1890	6.99	5.21	4.53
Contraction	VI	Aug 1890	Oct 1890	7.79	5.75	4.59
"	VII	Nov 1890	Jan 1891	5.30	6.64	4.68
"	VIII	Feb 1891	Apr 1891	3.02	5.11	4.66
Cycle 8, 1891–94						
Trough	I	Apr 1891	Jun 1891	3.64	5.32	4.74
Expansion	II	Jun 1891	Nov 1891	3.45	5.54	4.75
"	III	Dec 1891	Jun 1892	2.03	3.75	4.55
"	IV	Jul 1892	Dec 1892	4.28	4.66	4.52
Peak	V	Dec 1892	Feb 1893	4.60	5.19	4.53
Contraction	VI	Feb 1893	Jun 1893	5.71	6.54	4.57
"	VII	Jul 1893	Dec 1893	3.71	7.28	4.74
"	VIII	Jan 1894	May 1894	1.07	3.17	4.46
Cycle 9, 1894–97						
Trough	I	May 1894	Jul 1894	1.03	2.95	4.42
Expansion	II	Jul 1894	Dec 1894	1.08	2.96	4.36
"	III	Jan 1895	May 1895	1.73	3.47	4.34
"	IV	Jun 1895	Nov 1895	1.55	3.66	4.20
Peak	V	Nov 1895	Jan 1896	3.81	4.96	4.27
Contraction	VI	Jan 1896	Jun 1896	3.30	5.18	4.28
"	VII	Jul 1896	Nov 1896	5.92	6.97	4.43
"	VIII	Dec 1896	May 1897	1.65	3.40	4.18
Cycle 10, 1897–1901						
Trough	I	May 1897	Jul 1897	1.27	3.35	4.10
Expansion	II	Jul 1897	Feb 1898	2.02	3.57	4.05
"	III	Mar 1898	Sep 1898	2.15	4.24	4.08
"	IV	Oct 1898	May 1899	3.09	3.36	3.88
Peak	V	May 1899	Jul 1899	3.54	3.52	3.79
Contraction	VI	Jul 1899	Dec 1899	6.72	4.91	3.88
"	VII	Jan 1900	May 1900	3.08	4.43	3.89
"	VIII	Jun 1900	Nov 1900	2.46	4.28	3.89

TABLE 2 (*continued*). AVERAGES OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1958

(*In per cent per annum*)

Reference Cycles and Stages[1]		Cycle Periods: Initial month	Cycle Periods: Terminal month	Call Money Rates (Renewal Loans) or Treasury Bill Rates	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
Cycle 11, 1900–04				*Call Money*[4]		
Trough	I	Nov 1900	Jan 1901	4.42	4.39	3.84
Expansion	II	Jan 1901	Jul 1901	3.89	3.95	3.82
"	III	Aug 1901	Jan 1902	4.22	4.71	3.84
"	IV	Feb 1902	Aug 1902	3.87	4.46	3.81
Peak	V	Aug 1902	Oct 1902	7.40	5.46	3.87
Contraction	VI	Oct 1902	Apr 1903	5.45	5.45	3.94
"	VII	May 1903	Dec 1903	3.22	5.61	4.06
"	VIII	Jan 1904	Jul 1904	1.57	4.21	4.02
Cycle 12, 1904–08						
Trough	I	Jul 1904	Sep 1904	1.15	3.91	3.95
Expansion	II	Sep 1904	Jul 1905	2.51	4.06	3.90
"	III	Aug 1905	May 1906	6.69	5.14	3.93
"	IV	Jun 1906	Apr 1907	6.00	6.02	4.06
Peak	V	Apr 1907	Jun 1907	2.60	5.62	4.19
Contraction	VI	Jun 1907	Sep 1907	3.68	6.06	4.27
"	VII	Oct 1907	Jan 1908	13.15	7.16	4.45
"	VIII	Feb 1908	May 1908	1.76	4.78	4.30
Cycle 13, 1908–12						
Trough	I	May 1908	Jul 1908	1.47	3.78	4.25
Expansion	II	Jul 1908	Dec 1908	1.62	3.87	4.15
"	III	Jan 1909	Jun 1909	1.93	3.49	4.05
"	IV	Jul 1909	Dec 1909	3.48	4.46	4.09
Peak	V	Dec 1909	Feb 1910	4.18	4.77	4.12
Contraction	VI	Feb 1910	Sep 1910	2.66	4.96	4.19
"	VII	Oct 1910	Apr 1911	2.83	4.47	4.18
"	VIII	May 1911	Dec 1911	2.59	4.09	4.19
Cycle 14, 1911–15						
Trough	I	Dec 1911	Feb 1912	2.91	4.09	4.19
Expansion	II	Feb 1912	May 1912	2.62	4.07	4.20
"	III	Jun 1912	Aug 1912	2.82	4.51	4.24
"	IV	Sep 1912	Dec 1912	5.71	5.80	4.28
Peak	V	Dec 1912	Feb 1913	4.27	5.24	4.29
Contraction	VI	Feb 1913	Aug 1913	2.92	5.64	4.43
"	VII	Sep 1913	Apr 1914	2.86	4.84	4.45
"	VIII	May 1914	Nov 1914	4.29[5]	5.31	4.41[5]
Cycle 15, 1914–19						
Trough	I	Nov 1914	Jan 1915	3.64[5]	4.57	4.63[5]
Expansion	II	Jan 1915	Feb 1916	1.91	3.40	4.60
"	III	Mar 1916	May 1917	2.66	3.71	4.51
"	IV	Jun 1917	Jul 1918	4.50	5.48	5.12
Peak	V	Jul 1918	Sep 1918	5.84	5.94	5.37
Contraction	VI	Sep 1918	Oct 1918	6.00	6.00	5.34
"	VII	Nov 1918	Dec 1918	5.62	5.89	4.97
"	VIII	Jan 1919	Feb 1919	4.92	5.22	5.10

TABLE 2 (*continued*). AVERAGES OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1958

(*In per cent per annum*)

Reference Cycles and Stages[1]		Cycle Periods: Initial month	Cycle Periods: Terminal month	Call Money Rates (Renewal Loans) or Treasury Bill Rates	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
Cycle 16, 1919–21				*Call Money*[4]		
Trough	I	Feb 1919	Apr 1919	5.11	5.31	5.18
Expansion	II	Apr 1919	Jun 1919	5.76	5.43	5.20
"	III	Jul 1919	Sep 1919	5.82	5.40	5.39
"	IV	Oct 1919	Dec 1919	9.28	5.59	5.45
Peak	V	Dec 1919	Feb 1920	9.01	6.09	5.59
Contraction	VI	Feb 1920	Jul 1920	8.05	7.10	5.95
"	VII	Aug 1920	Dec 1920	7.40	7.96	5.70
"	VIII	Jan 1921	Jun 1921	6.67	7.40	5.69
Cycle 17, 1921–24						
Trough	I	Jun 1921	Aug 1921	5.72	6.31	5.73
Expansion	II	Aug 1921	Feb 1922	5.09	5.36	5.29
"	III	Mar 1922	Sep 1922	3.97	4.24	4.80
"	IV	Oct 1922	Apr 1923	4.72	4.72	4.91
Peak	V	Apr 1923	Jun 1923	4.86	5.05	5.00
Contraction	VI	Jun 1923	Sep 1923	4.99	5.00	4.98
"	VII	Oct 1923	Feb 1924	4.63	4.95	4.98
"	VIII	Mar 1924	Jun 1924	3.46	4.35	4.90
Cycle 18, 1924–27						
Trough	I	Jun 1924	Aug 1924	2.12	3.58	4.78
Expansion	II	Aug 1924	Apr 1925	3.01	3.48	4.76
"	III	May 1925	Dec 1925	4.45	4.12	4.71
"	IV	Jan 1926	Sep 1926	4.40	4.16	4.46
Peak	V	Sep 1926	Nov 1926	4.78	4.45	4.53
Contraction	VI	Nov 1926	Feb 1927	4.52	4.23	4.47
"	VII	Mar 1927	Jun 1927	4.22	4.08	4.37
"	VIII	Jul 1927	Oct 1927	3.86	3.97	4.32
Cycle 19, 1927–33						
Trough	I	Oct 1927	Dec 1927	3.96	3.97	4.22
Expansion	II	Dec 1927	Jun 1928	4.94	4.23	4.24
"	III	Jul 1928	Dec 1928	7.07	5.40	4.45
"	IV	Jan 1929	Jul 1929	8.28	5.80	4.59
Peak	V	Jul 1929	Sep 1929	8.65	6.07	4.68
Contraction	VI	Sep 1929	Oct 1930	4.01	4.24	4.46
"	VII	Nov 1930	Dec 1931	1.79	2.67	4.56
"	VIII	Jan 1932	Feb 1933	1.90	2.53	4.93
Cycle 20, 1933–38				*Treasury Bills*[6]		
Trough	I	Feb 1933	Apr 1933	1.113[7]	2.24	4.65
Expansion	II	Apr 1933	Jul 1934	.327	1.34	4.30
"	III	Aug 1934	Dec 1935	.157	.75	3.69
"	IV	Jan 1936	Apr 1937	.234	.84	3.24
Peak	V	Apr 1937	Jun 1937	.635	1.00	3.34
Contraction	VI	Jun 1937	Sep 1937	.526	1.00	3.26
"	VII	Oct 1937	Jan 1938	.173	1.00	3.22
"	VIII	Feb 1938	May 1938	.067	.91	3.24

TABLE 2 (*concluded*). AVERAGES OF CALL MONEY RATES (OR TREASURY BILL RATES), COMMERCIAL PAPER RATES, AND LONG-TERM BOND YIELDS DURING STAGES OF NBER REFERENCE CYCLES, 1858–1958

(*In per cent per annum*)

Reference Cycles and Stages[1]		Cycle Periods: Initial month	Cycle Periods: Terminal month	Call Money Rates (Renewal Loans) or Treasury Bill Rates	Commercial Paper Rates[2]	Long-Term Bond Yields[3]
Cycle 21, 1938–45				*Treasury Bills*[6]		
Trough	I	May 1938	Jul 1938	.034	.84	3.23
Expansion	II	Jul 1938	Aug 1940	.026	.60	3.00
"	III	Sep 1940	Nov 1942	.178	.59	2.79
"	IV	Dec 1942	Jan 1945	.374	.71	2.73
Peak	V	Jan 1945	Mar 1945	.375	.75	2.65
Contraction	VI	Mar 1945	Apr 1945	.375	.75	2.62
"	VII	May 1945	Jul 1945	.375	.75	2.61
"	VIII	Aug 1945	Sep 1945	.375	.75	2.62
Cycle 22, 1945–49						
Trough	I	Sep 1945	Nov 1945	.375	.75	2.62
Expansion	II	Nov 1945	Oct 1946	.375	.77	2.53
"	III	Nov 1946	Oct 1947	.510	1.01	2.58
"	IV	Nov 1947	Oct 1948	1.01	1.37	2.82
Peak	V	Oct 1948	Dec 1948	1.14	1.56	2.82
Contraction	VI	Dec 1948	Feb 1949	1.16	1.56	2.74
"	VII	Mar 1949	Jun 1949	1.16	1.56	2.70
"	VIII	Jul 1949	Sep 1949	1.03	1.46	2.63
Cycle 23, 1949–54						
Trough	I	Sep 1949	Nov 1949	1.06	1.38	2.60
Expansion	II	Nov 1949	Jan 1951	1.21	1.47	2.62
"	III	Feb 1951	Mar 1952	1.58	2.24	2.89
"	IV	Apr 1952	Jun 1953	1.94	2.38	3.05
Peak	V	Jun 1953	Aug 1953	2.14	2.75	3.31
Contraction	VI	Aug 1953	Nov 1953	1.70	2.59	3.20
"	VII	Dec 1953	Mar 1954	1.22	2.09	3.00
"	VIII	Apr 1954	Jul 1954	.79	1.59	2.88
Cycle 24, 1954–58[8]						
Trough	I	Jul 1954	Sep 1954	.87	1.36	2.88
Expansion	II	Sep 1954	Jul 1955	1.27	1.64	2.97
"	III	Aug 1955	Jul 1956	2.36	2.95	3.15
"	IV	Aug 1956	Jun 1957	3.06	3.60	3.68
Peak	V	Jun 1957	Aug 1957	3.30	3.88	4.00
Contraction	VI	Aug 1957	Oct 1957	3.52	4.03	4.11
"	VII	Nov 1957	Dec 1957	3.22	3.94	3.94
"	VIII	Jan 1958	Mar 1958	1.84	2.82	3.61
Trough	IX	Mar 1958	May 1958	1.18	1.98	3.60

Sources: For a description of the sources and the reference cycles, see the text of this Appendix.

[1] The terminal trough of each cycle, stage IX, which is not shown separately except for cycle 24, covers the same three months as the initial trough, stage I, of the next cycle. [2] Choice 60–90 day paper for 1858–1923; 4–6 month prime paper for 1924–58. [3] High-grade U.S. railroad bonds for 1858–1930; Moody's Aaa corporate bonds for 1931–58. [4] Renewal loans at the New York Stock Exchange. [5] The New York Stock Exchange was closed August-November 1914, and no quotations are available for that period. [6] New issues of 3-month bills. [7] Corresponding figure for call money: 1.90. [8] Cycle dates are tentative.

Fluctuating Exchange Rates in Countries with Relatively Stable Economies

Some European Experiences After World War I

S. C. Tsiang *

IN DISCUSSIONS OF EXCHANGE POLICY in recent years, the point has frequently been made in criticism of freely fluctuating exchange rates that, under such exchange systems, speculation can generally be expected to have a cumulative destabilizing influence, which will exaggerate any movements in the exchange rate and which might readily cause the breakdown of the exchange system. To support this contention, the historical experience of the interwar period, in particular that of the French franc from 1919 to 1926, has frequently been invoked.[1]

The case for or against fluctuating exchange rates is, of course, not to be settled merely by an examination of the question whether they are liable to abnormal and exaggerated movements under the pressure of speculative influences. Many other important relevant considerations must be taken into account. Moreover, the point that exchange rate policy is never something to be determined by itself and without reference to other elements of economic policy always deserves to be stressed. The question is, however, of sufficient interest to warrant a re-examination of some of the historical illustrations which have already played a part in the debate on exchange policy. After the conclusion of World War I, several European countries allowed their exchange rates to fluctuate for a period of several years, with little intervention by the monetary authorities. Where there was violent and uncontrolled domestic inflation, e.g., in Austria, Germany, and Poland, the currency rapidly depreciated to an infinitesimal fraction of

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[1] See especially R. Nurske, *International Currency Experience: Lessons of the Inter-War Period* (Geneva, 1944), pp. 117–22. For a theoretical analysis of the issues raised by this question, see S. C. Tsiang, "A Theory of Foreign Exchange Speculation Under a Floating Exchange System," *Journal of Political Economy*, Vol. LXVI, No. 5 (October 1958), pp. 399–418.

its original value in terms of gold or dollars. However, in several countries with freely fluctuating rates, the internal economies were not violently unstable. An examination of the experience of these countries suggests that under sound monetary and fiscal conditions a freely fluctuating exchange rate need not necessarily be liable to exaggerated fluctuations. Where violent exchange instability resulting from speculative activities did occur, the underlying condition of the instability can usually be traced to a supply of money and credit which was excessively elastic with respect to the interest rate; this permitted self-aggravating speculation in a cumulative process of general expansion as described by Wicksell.

Notable examples of such countries are the United Kingdom and, with some qualification, France and Norway. The United Kingdom on August 18, 1919 withdrew the exchange restrictions that had been applied in wartime. From that date, it was once more permissible to remit money abroad, to import securities, or to speculate in foreign exchange, although foreign capital issues continued to be subject to Treasury license. In November 1919, this remaining restriction was removed. The Bank of England's gold reserve remained practically unchanged from the end of 1920 to the restoration of the gold standard in April 1925 (Table 1). The enormous increase during 1920 was due to the concentration in the Bank of England of the gold holdings of the joint stock banks, in accordance with the recommendation of the Cunliffe Committee, rather than to any intervention by the Bank of England on the gold and exchange market. There was practically no official support of the exchange market during 1920-24 except perhaps that the Bank, acting as the agent for the Treasury in buying dollar exchange to service the U.S. and Canadian debts, might have exerted some influence on the exchange rate through the timing of its purchases.

In France, the law of April 3, 1918 which prohibited, except by permission of the Commission on Exchange, the export of capital and the import of securities and negotiable instruments was, nominally, not repealed until after the currency stabilization of 1926. However, this law was applied very liberally by the Commission after the war. It was generally admitted that, without the same rigorous control and supervision at the frontiers as was exercised during the war, the law could not be effectively enforced. Thus, for practical purposes, we may regard France as having no effective exchange control after World War I.

The franc was unpegged in March 1919. After that, official support of the exchange rate was said to have ended, except that during 1919 and 1920 certain essential foodstuffs were still imported by the Government. These imports were largely financed by the French Government

TABLE 1. FOREIGN EXCHANGE RESERVES AND TRADE BALANCE OF THE UNITED KINGDOM, 1919–25[1]

(In millions of pounds sterling)

	Gold Reserve of Treasury and Bank of England	Change from Preceding Quarter	Annual Balance of Trade
1919	119.8		−663
1920			−343
I	140.6	+20.8	
II	146.3	+5.7	
III	151.6	+5.3	
IV	156.8	+5.2	
1921			−264
I	156.8	—	
II	156.9	+0.1	
III	156.9	—	
IV	156.9	—	
1922			−166
I	157.3	+0.4	
II	157.4	+0.1	
III	157.4	—	
IV	157.5	+0.1	
1923			−195
I	154.0	−3.5	
II	154.6	+0.6	
III	154.7	+0.1	
IV	155.0	+0.3	
1924			−324
I	155.1	+0.1	
II	155.3	+0.2	
III	155.4	+0.1	
IV	155.6	+0.2	
1925			−384
I	155.7	+0.1	
II	157.6	+1.9	
III	160.5	+2.9	
IV	144.6	−15.9	

[1] Based on data from League of Nations, *Memorandum on Currency and Central Banks* and *Memorandum on International Trade and Balances of Payments.*

by drawing on the gold and foreign balances and credits of the Bank of France (including F 518 million which remained from credits granted by the U.S. Treasury to the French Treasury); in fact, during 1920 these balances declined by F 774 million (gold francs). After 1920, and until the stabilization of the franc at the end of 1926, changes in the gold reserve and balances abroad of the Bank of France were insignificant, both in proportion to the existing total gold and foreign exchange reserves and in proportion to current trade balances (Table 2). Thus, apart from three well-known instances of official intervention in the exchange market,[2] the external value of the French franc, from its

[2] The three instances of intervention are the massive counterspeculative selling of dollars and sterling with loans obtained from New York and London to support the franc during the February 1924 crisis; a short-lived attempt to peg the exchange rate from July to September 1925; and the use of the balance of the U.S. loan to tide the Government over the crisis of July 1926.

TABLE 2. FOREIGN EXCHANGE RESERVES AND TRADE BALANCE OF FRANCE, 1919–26[1]

	Bank of France				Annual Balance of Trade
	Gold reserve	Balances and credits abroad	Total	Change from preceding quarter	
	(*million gold francs*)				(*million current francs*)
1919	5,578	797	6,375	—	
1920					−22,536
I	5,585				
II	5,588				
III	5,479				
IV	5,500	101	5,601	−774[2]	
1921					−2,724
I	5,504				
II	5,520				
III	5,523				
IV	5,524	108	5,632	+31[2]	
1922					−2,981
I	5,526				
II	5,528				
III	5,532				
IV	5,535	73	5,608	−24[2]	
1923					−1,965
I	5,536				
II	5,538				
III	5,538				
IV	5,540	76	5,616	+8[2]	
1924					+2,332
I	5,542	79	5,621	+5	
II	5,543	71	5,614	−7	
III	5,544	68	5,612	−2	
IV	5,545	70	5,615	+3	
1925					+2,032
I	5,546	71	5,617	+2	
II	5,547	76	5,623	+6	
III	5,547	61	5,608	−15	
IV	5,548	64	5,612	+4	
1926					−395
I	5,548	70	5,618	+6	
II	5,548	76	5,624	+6	
III	5,548	79	5,627	+3	
IV	5,548	85	5,633	+6	

[1] Based on data from League of Nations, *Memorandum on Currency and Central Banks* and *Memorandum on International Trade and Balances of Payments.*
[2] Change from last quarter of preceding year.

unpegging to its stabilization, might be regarded as determined from day to day by the free play of supply and demand in a market operating without any official intervention.

The Norwegian krone was cut loose from its gold anchor by the imposition of restrictions on the import and export of gold and by the fact that the conversion of notes into gold was made conditional upon a declaration that the gold so obtained would not be exported. Otherwise, there was no restriction on exchange dealings. The gold reserve of the Bank of Norway was unchanged from 1920 through 1927. There were some minor variations in the Bank's foreign assets, but the

changes were quite small compared with the annual balance of trade. In particular, during the crucial period of renewed krone depreciation in 1923 (owing to resumed internal inflation) and the subsequent reversal of this trend in the first half of 1924, changes in the foreign assets of the Bank of Norway were insignificant (Table 3). Thus, the experience of the Norwegian krone after World War I, in particular during the crucial period mentioned above, provides another illustration of a

TABLE 3. FOREIGN EXCHANGE RESERVES AND TRADE BALANCE OF NORWAY, 1919–27[1]

(In millions of kroner)

	Bank of Norway				
	Gold reserve	Foreign assets	Total	Change from preceding quarter	Annual Balance of Trade
1919	148	81	229	—	
1920					– 1,787
I	147				
II	147				
III	147				
IV	147	63	210	– 19[2]	
1921					– 828
I	147				
II	147				
III	147				
IV	147	47	194	– 16[2]	
1922					– 528
I	147				
II	147				
III	147				
IV	147	58	205	+11[2]	
1923					– 525
I	147	38	185	– 20	
II	147	35	182	– 3	
III	147	34	181	– 1	
IV	147	32	179	– 2	
1924					– 481
I	147	33	180	+1	
II	147	32	179	– 1	
III	147	49	196	+17	
IV	147	51	198	+2	
1925					– 322
I	147	61	208	+10	
II	147	70	217	+9	
III	147	76	223	+6	
IV	147	70	217	– 6	
1926					– 282
I	147				
II	147				
III	147				
IV	147	89	236	+19[2]	
1927					– 293
I	147				
II	147				
III	147				
IV	147	65	212	– 24[2]	

[1] Based on data from League of Nations, *Memorandum on Currency and Central Banks* and *Memorandum on International Trade and Balances of Payments.*

[2] Change from last quarter of preceding year.

practically free floating exchange rate at a time when there was a certain amount of stress from internal inflation.[3]

For each of these countries, direct statistics on speculative capital movements are generally not available for the period concerned. Even if the statistics of the capital accounts of the balances of payments of these countries were better than they actually are, there would be no way of distinguishing speculative from nonspeculative capital movements. Furthermore, speculation in foreign exchange may have taken the form of postponement or anticipation of exports and imports and thus have remained hidden in the trade account of the balance of payments. Therefore, in this study, an indirect measure of speculative activity—the deviation of the fluctuating exchange rate from the purchasing power parity of the currency concerned—is taken as the main indicator of the pressure of abnormal speculative forces. Admittedly, the equilibrium rate of exchange that is established if there is no speculation does not necessarily coincide with the purchasing power parity. Changes in reciprocal supply and demand conditions or in the degree of employment maintained in the countries concerned, differences in the nature of the price indices employed, etc., may prevent the purchasing power parity from being an exact and reliable indicator of the equilibrium rate that would maintain the balance of normal international payments and receipts. Nevertheless, even though the absolute gap between the exchange rate and the purchasing power parity at any particular moment probably does not necessarily signify a divergence of the exchange rate from the equilibrum rate, a tendency for the rate to deviate more and more from the purchasing power parity within a fairly short period may be taken as due largely to speculative pressure unless it can be accounted for by nonspeculative factors, such as sudden changes in supply and demand conditions for exports or imports or in nonspeculative capital movements.[4]

[3] In the same postwar period, several other countries with fairly stable internal economies allowed their exchange rates to fluctuate, e.g., Canada, the Netherlands, and Sweden. However, in these countries the changes in gold and foreign exchange reserves, which were not negligible, suggest that the interventions of the monetary authorities in the exchange markets were more significant than in the United Kingdom, France, and Norway. The fluctuations of their exchange rates, therefore, reflected less fully the free play of supply and demand (including speculation) on the exchange markets.

[4] This indirect indicator is adequate as a rough index of speculative pressure in countries with fairly stable internal economies, such as those selected for examination here. For, as long as the wholesale price index of the country concerned includes prices of some domestic goods, a rise in the cost of foreign exchange caused by speculative purchases would leave the domestic wholesale price index lagging behind the cost of foreign exchange.

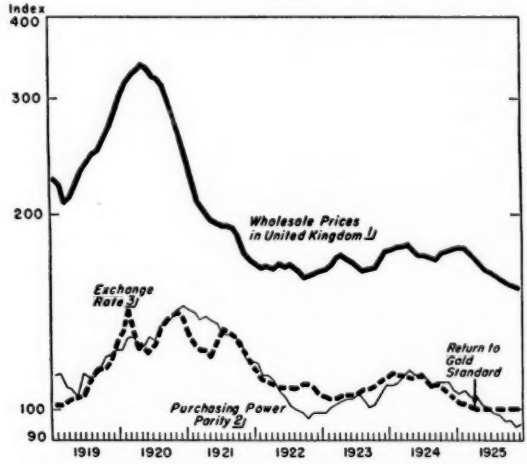
This index is no longer useful when domestic inflation becomes so violent that the public simply adopts foreign exchange as the ultimate standard of value, and

A Fluctuating Exchange Rate with Declining or Stable Domestic Prices

The experience of the United Kingdom from the middle of 1920 to the return to gold in April 1925 provides an illustration of a freely fluctuating exchange system in a period when domestic prices were declining or were stable. In Chart 1, the fluctuations of the sterling-

CHART 1. WHOLESALE PRICES IN THE UNITED KINGDOM AND EXCHANGE RATE AND PURCHASING POWER PARITY OF STERLING, 1919–25

(*Logarithmic vertical scale*)



Sources: League of Nations, *Memorandum on Currency, Memorandum on Currency and Central Banks,* and *International Statistical Year-Book.*

[1] Index computed by the Federal Reserve Board for comparison with the United States (1913 = 100).

[2] Federal Reserve Board index of wholesale prices in the United Kingdom divided by Federal Reserve Board index of wholesale prices in the United States (1913 = 100).

[3] Cost of dollar in pounds as percentage of par.

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merchants and manufacturers automatically adjust the prices of their goods in proportion to any change in the exchange rate, as indeed happened in the late stage of hyperinflation in Germany, Austria, and Poland. But these cases of hyperinflation are not dealt with here because it is pointless to discuss the stability of any exchange system in such situations.

dollar exchange rate are compared for the years 1919–25 with the fluctuations in the ratio of the wholesale price index in the United Kingdom to that in the United States. The U.S. dollar is taken as the standard of comparison because of its free convertibility into gold and the complete absence of restrictions on foreign exchange dealings in the United States after June 1919.

The major fluctuations in the sterling exchange rate, of which there were three, were concentrated in 1920 and 1921, the two turbulent postwar years, when inflation and scarcity were followed by a sharp worldwide recession. After 1921, when internal prices in the United Kingdom were more or less stable, the fluctuations of the exchange rate were mostly minor. If progressive deviation of the fluctuating exchange rate from the purchasing power parity is to be taken as an indication of the pressure of abnormal speculative forces, there are only two likely cases of the destabilizing influence of speculative activity, viz., sterling's sharp depreciation from November 1919 to February 1920 and its rapid appreciation from December 1920 to May 1921.

After the unpegging of the pound early in 1919, the cost of the U.S. dollar in terms of the pound rose steadily, reflecting the gradual adjustment of the exchange rate to the relative purchasing powers of the two currencies as more normal trade relations were resumed and restrictions on exchange dealings were gradually removed. Toward the end of 1919, the rise in the cost of the dollar (in terms not only of the pound but of practically all European currencies) noticeably increased in speed—and far outstripped the rise in the relative purchasing power of the dollar—until a peak was reached in February 1920.

A progressive deviation of this kind of the actual exchange rate from the purchasing power parity suggests that the destabilizing influence of speculation was probably at work. However, factors other than speculative capital movements contributed strongly to the almost universal sharp depreciation of European currencies toward the end of 1919 and during the opening months of 1920. According to some authorities,[5] the sharp depreciation of European currencies at that time was induced to a large extent by the monetary policy of the Federal Reserve Board. Ever since the early months of 1919, U.S. exporters had been exporting on a large scale to Europe and receiving depreciating currencies in return. Such export credits provided strong support for the European currencies despite the fact that the exchange rates of some were probably above their respective purchasing power parities. Such export credits, therefore, really constituted a kind of specu-

[5] See, for example, R. G. Hawtrey, Essay No. V, "The Federal Reserve System of the United States," in his *Monetary Reconstruction* (London, 1923), pp. 93–130.

lative capital flow in a stabilizing direction. To hold these balances abroad, however, it was necessary for the exporters to obtain advances in dollars from their bankers in the United States. Toward the end of 1919, the Federal Reserve authorities, being concerned about the inflationary tendency in the United States itself, repeatedly exhorted the commercial banks to be cautious in lending. Beginning in November 1919, the authorities successively raised the discount rate from 4 per cent, the rate effective in October, to 6 per cent at the end of January 1920. The market rates of discount for commercial paper quickly responded. From 5¼ per cent in October 1919, the rate in New York rose to 6 per cent in the second half of December, and by the end of February 1920 it was almost 7 per cent. The rise of the interest rate on call loans in New York was even more spectacular. In September 1919, the rate averaged 6.10 per cent; in certain weeks of January and February 1920, the averages were such phenomenally high figures as 16 per cent and 17 per cent.[6] Thus, as shown in Table 4, the market rates of interest in the closing months of 1919 and the opening months of 1920 were actually higher in the United States, the currency of which was then freely convertible into gold, than in any of the European countries studied here, although the currencies of these countries had been subjected to a much greater degree of internal inflation and during 1919 had depreciated relative to the dollar.

U.S. banks responded to the Federal Reserve Board's warning of inflation and to the sharp rise in the discount rate by vigorously calling in their loans, and the flow of export credits to Europe, i.e., the speculative capital that exerted a stabilizing influence upon the European currencies, was suddenly shut off. The exchange markets in Europe were thus struck with something approaching panic. Practically every European currency depreciated sharply.[7] Thus, the abrupt stoppage of the outflow of stabilizing speculative capital from the United States rather than a spontaneous and cumulatively growing speculative demand for dollar exchange in European countries appears to have been the principal cause of the sharp depreciation of sterling—and indeed of almost all European currencies at that time.

The abrupt recall of U.S. credit and the sharp depreciation thus caused does not seem to have started a cumulative flight from the pound, however. The depreciation that did occur was soon reversed

[6] See Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics* (Washington, November 1943), p. 452.

[7] The guilder was an outstanding exception. From August to November 1919, it had been appreciating slightly in terms of the dollar, because prices in the Netherlands were more stable than U.S. prices. When the exchange crisis occurred in early 1920, the guilder was affected to only a minor extent.

TABLE 4. RATES OF INTEREST IN THE UNITED STATES AND SELECTED EUROPEAN COUNTRIES, 1919–21

(In per cent)

	United States			France		Norway	United Kingdom		
	Discount rate[1]	Prime commercial paper[2]	Call loan rate[2]	Discount rate[1]	Call loan rate[2]	Discount rate[1]	Discount rate[1]	Three-month rate[2]	Day-to-day rate[3]
1919									
Oct	4.0	5.25	8.56	5.0	—	—	5.0	4.56	2.88
Nov	4.75	5.25	11.06	5.0	—	—	6.0	5.81	4.38
Dec	4.75	5.88	10.04	5.0	—	—	6.0	5.56	3.00
1920									
Jan	6.0	6.00	8.90	5.0	4.00	6.0	6.0	5.63	3.63
Feb	6.0	6.38	10.17	5.0	4.75	6.0	6.0	5.72	4.50
Mar	6.0	6.88	8.59	5.0	5.13	6.0	6.0	5.75	3.50
Apr	6.0	6.88	8.59	6.0	4.50	6.0	7.0	5.94	3.19
May	7.0	7.38	8.21	6.0	3.50	6.0	7.0	6.34	5.25
Jun	7.0	7.88	7.20	6.0	3.50	6.0	7.0	6.66	4.41
Jul	7.0	8.13	8.36	6.0	4.50	7.0	7.0	6.63	4.88
Aug	7.0	8.13	7.24	6.0	4.00	7.0	7.0	6.69	4.38
Sep	7.0	8.13	7.02	6.0	4.38	7.0	7.0	6.78	5.12
Oct	7.0	8.13	8.10	6.0	3.13	7.0	7.0	6.66	4.75
Nov	7.0	8.13	7.76	6.0	3.50	7.0	7.0	6.78	5.31
Dec	7.0	8.00	6.93	6.0	2.25	7.0	7.0	6.78	4.69
1921									
Mar	7.0	7.63	6.68	6.0	2.75	7.0	7.0	6.38	5.75
Jun	6.0	6.75	5.98	6.0	3.25	7.0	6.0	5.59	4.19
Sep	5.0	6.00	5.12	5.5	4.10	6.5	5.5	4.09	2.75
Dec	4.5	5.13	5.19	5.5	4.62	6.5	5.0	3.50	2.44

Sources: International Conference of Economic Services, *International Abstract of Economic Statistics, 1919–1930* (London, 1934), and Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics* (Washington, November 1943).

[1] Rate prevailing at the end of the month.

[2] Monthly average rate.

[3] Monthly average of maximum and minimum rates.

in March 1920, apparently without any major government intervention in the exchange market or any drastic monetary measures. By April, the pound had recovered to a level above its December quotation although there was no relaxation of the tight money policy in the United States; indeed, that policy was further tightened in May.[8]

[8] The timing of the quick recovery of sterling and other European currencies that followed it as the leader might have been influenced by some favorable incidents, such as the announcement on March 6 by Sir Austen Chamberlain, the Chancellor of the Exchequer, that the British Government was ready to pay its half of the Anglo-French loan on the due date, October 15, 1920, without having to resort to reborrowing outside the United Kingdom. This indicated that the British Government had been in the market for dollars for some time and that it had probably largely satisfied its needs and would not have to purchase additional dollars for this purpose. It strengthened confidence in the soundness of the pound and relieved the pressure upon the exchange rate which was the result of government purchases of dollars and gold on the Anglo-French Loan Account. This, however, was probably not the only cause for the recovery of the pound from its greatly undervalued rate of exchange during February. The basic underlying reason was the confidence of the public, which was encouraged by the Government's acceptance of the deflationary policy and the return to the gold standard

The second major upswing of the dollar exchange rate in the United Kingdom, which started in June 1920, does not appear to have been brought about by destabilizing speculative capital movements, for it followed closely the rise in the purchasing power parity of the dollar in terms of the pound. Furthermore, the purchasing power parity of the dollar did not rise because of any increase in the United Kingdom in domestic prices, which had indeed started to decline by then, but because of the relatively more rapid fall in prices in the United States, where a recession set in after June 1920.

The sharp appreciation of the pound that followed from December 1920 to May 1921 again carried its exchange rate away from its purchasing power parity, leading on this occasion, however, to progressive overvaluation, instead of undervaluation, of the pound in terms of the dollar. This suggests destabilizing speculative capital movements in favor of the pound. There appear to be some reasons for believing that, to a certain extent, this was the case. The decline in world market prices of primary commodities following the U.S. recession put an end to heavy European buying for restocking. The reduced demand from European countries for wheat and cotton from the United States was believed to have intensified agricultural distress in the United States. Increased political pressure was therefore brought to bear on the U.S. Government to establish large export credits as a measure to relieve agricultural depression. In January 1921, the U.S. Secretary of the Treasury was authorized by a joint resolution of both Houses of Congress to revive the activities of the War Finance Corporation in financing U.S. exports. At about the same time, negotiations for refunding the British debt to the United States were started with a visit by Lord Chalmers to New York. Both these developments encouraged substantial speculative purchases of sterling.

This optimistic mood carried the dollar exchange rate of the pound to a peak in May 1921, considerably above its purchasing power parity. In June, the tide again turned and the third major postwar wave of sterling depreciation started. This movement, however, appears to have merely narrowed the gap between the exchange rate of the pound and its purchasing power parity, which had been widened by the preceding wave of optimism. The evaporation of the excessive optimism might be partly accounted for by labor disputes in the United Kingdom. A coal miners' strike started on April 1 and lasted until July 1; and for several weeks in June (June 6–24), workers in the cotton industry also were

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at the prewar parity recommended by the Cunliffe Committee, and by the Government's announcement on December 15, 1919 that it would establish as a maximum for the currency note issue in any year the maximum amount actually outstanding in the previous year.

on strike. These disputes in the two chief export industries of the United Kingdom were sufficient to dispel the excessive optimism which speculators had entertained about sterling. Moreover, heavy purchases of dollars by the German authorities on reparations account in the last week of May and the first week of June, following a decision of the Reparations Committee that it would accept part of the German reparations payments in dollars in New York, was a direct cause of the sharp rise of the dollar exchange rate in June.

This sharp decline in the dollar value of the pound, however, appears not to have generated any significant cumulative speculative flight from the pound. For in August 1921, when the exchange rate of the pound became more in line with its purchasing power parity, it began to appreciate with the gradual increase in its purchasing power relative to that of the dollar.

After August 1921, the movements in the exchange rate of the pound followed more or less closely the broad movements in its purchasing power parity up to the stabilization of the pound in April 1925. There was another period, viz., March to October 1922, during which the exchange rate again diverged from the purchasing power parity to a considerable extent. At that time, however, the divergence was caused by the relative stickiness of the exchange rate of sterling in face of a continued increase in its relative purchasing power, rather than by any tendency for the exchange rate to fluctuate more than the purchasing power parity. This interruption in the appreciation of sterling was probably induced initially by another round of labor disputes, which led to a lockout in the engineering industry lasting from March 12 to June 13. The situation was further aggravated by the deadlock over German reparations after a proposal to grant a foreign loan to Germany fell through in June. The deadlock over German reparations shut off the supply of U.S. loans to Europe.[9]

After October 1922, with the further progress and final success of the negotiations for funding the British war debt to the United States, the pound appreciated, the gap between the exchange rate and the purchasing power parity narrowed, and there were no further major divergences between the exchange rate of sterling and its purchasing power parity.

If the immediate postwar years of abnormal scarcity and inflation followed by a sharp recession, i.e., 1919–21, are omitted and only those

[9] According to the estimates of the U.S. Department of Commerce, there was a net inflow of $375 million of short-term capital into the United States in 1922, against a net outflow of $435 million in the preceding year, and the net total capital outflow, including both short-term and long-term capital, declined by $850 million, from $1,192 million in 1921 to $342 million in 1922. See *The Balance of International Payments of the United States in 1936* (Washington, 1937), pp. 93–95.

years when conditions had returned more or less to normal are taken into account, viz., 1922 up to the restoration of the gold standard in the United Kingdom, the record shows that the exchange rate of the pound fluctuated much less than either the domestic price level in the United Kingdom or the purchasing power parity of the pound in terms of the U.S. dollar. This interesting fact is shown by the following comparison of the standard deviation of the exchange rate of the pound, measured from its own 12-month moving average, with the standard deviations first of the domestic wholesale price index in the United Kingdom and then of the purchasing power parity of the pound in terms of the U.S. dollar, similarly computed: exchange rate, 1.6; wholesale price index, 2.5; purchasing power parity, 2.2.[10]

According to this criterion, once the turmoil of the immediate postwar inflation and recession was over, the exchange rate of the pound was, until the restoration of the gold standard, definitely more stable not only than domestic wholesale prices but also than the purchasing power parity of sterling in terms of the U.S. dollar. The relative stability of the exchange rate implies that, over the periods concerned, speculative activities on the exchange market were mainly in a stabilizing direction.

A Fluctuating Exchange Rate with Moderate Internal Inflation

In France and Norway, the postwar recession of 1920–21 was followed not, as in the United Kingdom, by a persistent deflationary policy with a view to restoring the prewar exchange rate, but by some degree of inflation. A comparative study of the experiences of these two countries is particularly interesting: in France, the resumption of inflation led to repeated exchange crises in which the exchange value of the franc had to be protected by drastic government interventions; but in Norway there was no exchange crisis even though the Government did not intervene in the exchange market.

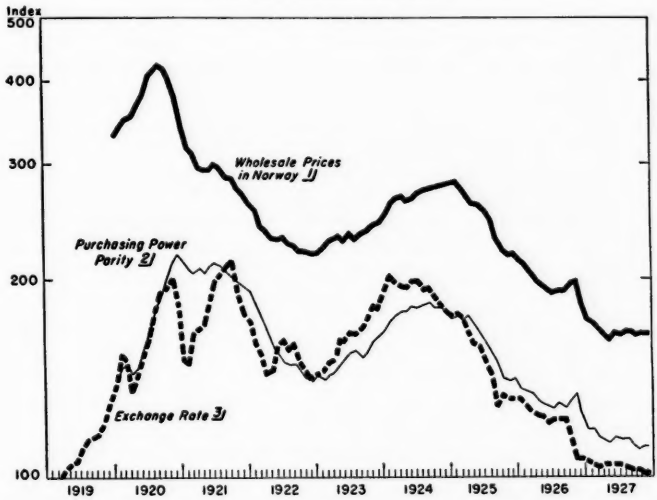
Norway

In the early postwar years 1920 and 1921, the pattern and the timing of the fluctuations of the exchange rate of the Norwegian krone were similar to those of sterling (compare Charts 1 and 2). This indicates that probably the same international factors were at work in causing the three waves of depreciation of both currencies during 1920 and

[10] Computations are based on the period July 1922–April 1925.

CHART 2. WHOLESALE PRICES IN NORWAY AND EXCHANGE RATE AND PURCHASING POWER PARITY OF NORWEGIAN KRONE, 1920–27

(*Logarithmic vertical scale*)



Sources: League of Nations, *Memorandum on Currency, Memorandum on Currency and Central Banks,* and *International Statistical Year-Book.*

[1] *Økonomisk Revue* index (1913 = 100) for period 1920–25; official index (1913 = 100), 1926–27.

[2] Index of wholesale prices in Norway (*Økonomisk Revue* index, 1920–25, official index, 1926–27) divided by Bureau of Labor Statistics index of wholesale prices in the United States (1913 = 100).

[3] Cost of dollar in Norwegian kroner as percentage of par.

1921. In Norway, as in the United Kingdom, there was apparently no indication of a self-aggravating speculative flight of capital during those two years. The first wave of depreciation, induced chiefly by the abrupt tightening of credit in the United States, did not carry the exchange rate of the krone much below its purchasing power parity. The sharp depreciation of the dollar value of the krone from May to November 1920 was no more than parallel to the decline of its purchasing power parity in terms of the dollar, which was the result of a combination of steeply rising prices in Norway up to September 1920 and declining prices in the United States after June 1920. The resumed depreciation of the krone in 1921 was probably also a reaction to the over-optimism generated by the revival of the activities of the U.S. War Finance Corporation in financing U.S. exports and the resumption of

normal import demand after a temporary drop following the heavy postwar demand for restocking. Again, as with the pound, depreciation did not go much beyond the purchasing power parity. After the rate had depreciated approximately to the level of the purchasing power parity, the movement stopped, and the rate then appreciated with the gradual increase in the relative purchasing power of the krone in terms of the dollar.

The movements of the Norwegian exchange rate after the recession of 1921–22 are of greater interest. From the beginning of 1923, Norway again entered a period of rising prices, which lasted until March 1924. Throughout this period of renewed inflation, the exchange rate (expressed in terms of kroner per dollar) tended to rise faster than, and to deviate rather widely from, the purchasing power parity of the dollar in terms of the krone. This seems to indicate a growing speculative demand for foreign exchange in Norway as people began to anticipate further declines in the value of the krone.[11] This tendency, however, was arrested by a vigorous tight money policy. In November 1923, the Bank of Norway raised its discount rate to 7 per cent (the discount rate in the United States was then 4½ per cent and in the United Kingdom 4 per cent), after having raised it from 5 per cent to 6 per cent in May. It also vigorously contracted its credit and money supply. The Bank of Norway's assets in the forms of commercial bills, investments, and loans and advances were reduced from NKr 413.6 million at the end of 1923 to NKr 373.3 million at the end of March and NKr 331.9 million at the end of December 1924. Notes in circulation plus current accounts at the Bank of Norway (other than government deposits) were reduced from NKr 521.4 million at the end of 1923 to NKr 474.8 million at the end of March and NKr 501.3 million at the end of December 1924.[12] Such stringent monetary measures soon slowed down the rate of price increase and checked the decline of the purchasing power parity of the krone relative to the dollar. It was also remarkably effective in curbing the speculative demand for foreign exchange; for the krone began to appreciate after the end of February 1924, even before internal prices stopped rising, and the gap between the exchange rate and the price parity was rapidly closed. As pointed out above and as may be seen from Table 3, there were hardly any appreciable changes in the Bank of Norway's holdings of gold and foreign assets from March 1923 to June 1924, a fact which indicates that there was

[11] The speculative demand for foreign exchange might have been stimulated by the failure of two large Oslo banks, Centralbanken and Foreningsbanken, in March 1923.

[12] League of Nations, *Memorandum on Currency and Central Banks, 1913–1924*, Vol. II (Geneva, 1925), Table 17, pp. 118–19.

no direct intervention by the monetary authorities in the exchange market during this crucial period of exchange depreciation and its subsequent reversal. In the third and fourth quarters of 1924, the Bank's holdings of foreign assets increased a little, indicating that the effectiveness of monetary measures was such that the appreciation of the krone continued in spite of the Bank's additions to its foreign assets.

From March 1925, wholesale prices in Norway began to decline rapidly. This time the exchange rate of the krone showed a tendency to appreciate faster than the rise in its relative purchasing power, despite the fact that the Bank of Norway continued to add to its foreign assets; this indicated some speculative anticipation of the continuous appreciation of the krone toward its prewar par.[13] The case of Norway is, therefore, of particular interest as it includes both an inflationary and a deflationary phase after the postwar recession.

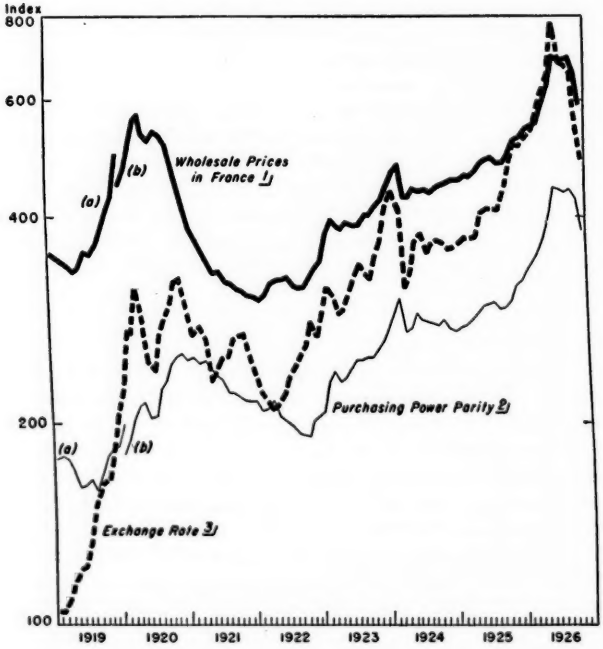
France

Except for some differences in the timing of the turning points, the fluctuations of the French franc during 1920 and 1921 were more or less of the same general pattern as those of sterling and of the Norwegian krone (compare Charts 1, 2, and 3). This indicates that the three waves of depreciation of the franc during 1920 and 1921 were probably due to the same international factors that caused similar movements in the exchange rates of other European currencies. However, the fluctuations of the franc differed from those of the other currencies not merely in intensity; another difference was that each wave of depreciation tended to cause the exchange rate to deviate widely from the purchasing power parity, a fact which suggests that speculative demand played a considerable role in each wave of depreciation. No doubt, an important factor making for this difference in the behavior of the exchange rates was that the rise in prices during 1919 and the early months of 1920 was more severe in France than in the United Kingdom and Norway. It is also significant that, although France had undergone a much greater degree of internal price inflation during 1919 and the early months of 1920 than had the United States, there was a persistent refusal throughout 1920 and in the first half of 1921 to raise the French official discount rate to the same level as the discount rate in the United States (Table 4). In contrast, the official discount rates in the United Kingdom and Norway during 1920 and 1921 were kept either the same as, or higher than, the discount rate in the United States.

[13] Such speculative anticipation persisted despite the fact that a special commission appointed by the Norwegian Government in 1925 reported in January 1926 in favor of stabilization at the existing rate.

CHART 3. WHOLESALE PRICES IN FRANCE AND EXCHANGE RATE AND PURCHASING POWER PARITY OF FRENCH FRANC, 1919–26

(*Logarithmic vertical scale*)



Sources: League of Nations, *Memorandum on Currency, Memorandum on Currency and Central Banks,* and *International Statistical Year-Book.*

[1] (a) French official index of wholesale prices (1913 = 100). (b) Federal Reserve Board index of wholesale prices in France (1913 = 100).

[2] (a) French official index of wholesale prices in France divided by Federal Reserve Board index of wholesale prices in the United States (1913 = 100). (b) Federal Reserve Board index of wholesale prices in France divided by Federal Reserve Board index of wholesale prices in the United States (1913 = 100).

[3] Cost of dollar in French francs as percentage of par.

Furthermore, because of the existence of a large amount of floating debt consisting chiefly of *bons de la défense nationale,* which were issued constantly on tap at fixed rates of interest and a large proportion of which was continuously maturing, the discount rate of the central bank had become very ineffective in regulating market short-term rates

of interest in France.[14] For if there was any stringency in the supply of credit, the public and the commercial banks could always obtain additional supplies of money simply by refusing to reinvest the proceeds of maturing short-term Treasury bills. The Government was then forced to borrow from the Bank of France to meet the net withdrawal of funds from government short-term bills by the public or commercial banks.

This in effect implied that the market rates of interest were pegged to a large extent by the Government, and that the Bank of France was quite powerless to regulate the market rates by manipulating its own discount rate. Thus, throughout the turbulent postwar years up to the crash of the franc in 1926, the short-term market rate in France remained extremely unresponsive to the discount rate of the Bank of France. In particular, during 1920 and 1921, the short-term market rate (as represented by the call loan rate) in France stayed considerably below the official discount rate, whereas in the United States the call loan rate was either above or not far below the official discount rate, and not infrequently it rose substantially above it.

The maintenance of relatively cheap and easy money conditions in France, in spite of a rather strong internal price inflation, probably accounted for the more violent fluctuations in the exchange rate and the apparently greater role played by speculative demand on the exchange market. Such a cheap money policy, in face of a tight money policy in the United States and elsewhere, implied that whenever speculators on the foreign exchange market expected a further appreciation of foreign exchange assets in terms of domestic currency, they could readily convert their holdings of domestic short-term assets into appreciating foreign exchange assets not only at no loss of interest, but actually with a gain in interest differential. Nevertheless, despite such favorable conditions for speculation, the French franc did not plunge into a vicious cycle of depreciation and speculation each time a sharp

[14] Most of the French Government's floating debt consisted of *bons de la défense nationale* which ran for a year or less. The rates of interest of the *bons* of different maturities from 1920 to 1926 (as given in Ministère des Finances de la République Française, *Inventaire de la situation financière*, Paris, 1946, p. 547) were as follows:

	1-month	2-month	3-month	6-month	1-year
1920	3.6%	3.9%	4.0%	4.5%	5.0%
1926					
Jan. 1	3.0	3.3	4.0	4.5	5.0
Dec. 31	—	—	4.0	4.5	5.5

Bons outstanding at the end of 1919 amounted to F 46.14 billion, and at the end of 1920 to F 48.94 billion, compared with F 37.28 billion for 1919 and F 37.90 billion for 1920 of Bank of France notes in circulation (Eleanor Lansing Dulles, *The French Franc, 1914–1928*, New York, 1929, pp. 94 and 482–83).

depreciation was engendered by some unfavorable exogenous development, such as the abrupt tightening of U.S. credit at the beginning of 1919, the onset of recession in the United States and the sharp decline of prices there after June 1920, and the sudden large transfers, mentioned above, of reparation payments to New York via Paris, as well as via London, in May and June 1921. Instead, each time after a sharp depreciation, the exchange rate of the franc still managed to recover to the neighborhood of its purchasing power parity, apparently without any large-scale government intervention. This fact indicates that speculators still retained their confidence in the value of the franc, and that their speculative demands for foreign exchange, if they had indeed played a part in aggravating the depreciation, were not cumulatively self-inflammatory, but were rather self-correcting in the end.

From the second quarter of 1922, French prices began to rise again. Soon after, the exchange rate of the franc began to depreciate more than its purchasing power parity, and the gap between the exchange rate and the purchasing power parity began to widen. After a few ups and downs, it widened progressively until the exchange crisis of early 1924. This seems to indicate the influence of a kind of self-inflammatory speculative demand for foreign exchange. It must be added, however, that during this period speculation against the French franc was started to a great extent by the political disturbances of the time rather than by purely economic factors. For instance, the first spurt of depreciation, which started in May 1922 while the relative purchasing power of the franc in terms of the dollar was still rising, was no doubt caused by the reparation deadlock that impeded the flow of U.S. credit to Europe, a factor which, as pointed out above, also influenced to a greater or less extent the exchange rates of sterling and other European currencies. The reparation crisis was followed by the international tension caused by the French occupation of the Ruhr in January 1923, which led to another wave of depreciation of the franc. These successive shocks, superimposed upon a basic inflationary trend and continuous budget deficits, weakened confidence in the franc. Finally, in November 1923, after the revelation of the French Government's inability to face the obligation to reduce its advances from the Bank of France in accordance with the 1920 Convention, a wave of speculative selling of the franc started.[15] The exchange rate of the franc plummeted from approximately F 17 per U.S. dollar at the end of October 1923 to more than F 27 on March 11, 1924. The decline was finally checked by large-scale government intervention on the exchange market with a loan of $100 million from J. P. Morgan and Co. of New York and another of

[15] The speculative assault of the franc was said to have first started in Amsterdam and London (see E. L. Dulles, *op. cit.*, p. 170).

£4 million from Lazard Frères of London. At the same time, a 20 per cent tax increase was voted during the emergency.

The Government's strong counterspeculative intervention with its large newly acquired foreign exchange resources, and the stiff tax increase that promised to eliminate a budget deficit, restored confidence in the franc. The upward recovery was so quick that the dollar exchange rate fell from the high point of F 27.20 per dollar on March 11 to a low of F 15.32 on April 22. The speculative demand reversed its direction during this recovery, so that by the latter date the Government was able to recoup all the dollars and pounds sold previously in support of the franc.[16]

This franc crisis should be compared with the somewhat similar fluctuations of the Norwegian krone at approximately the same time, as described above. It has already been pointed out that the resumption of price inflation in Norway after the end of 1922 also led to a progressive widening of the gap between the exchange rate of the krone and its purchasing power parity (i.e., to a progressive undervaluation of the krone). This tendency, however, was not allowed to develop into a full-scale speculative exchange crisis, because the Norwegian monetary authorities took firm deflationary measures. The discount rate of the Bank of Norway, which was raised from 5 per cent to 6 per cent in May 1923, was raised again, to 7 per cent, in November of that year, and the bills discounted, investments, loans, and advances of the Bank of Norway were curtailed. Such monetary measures were sufficient to turn the tide of depreciation and to close the gap between the exchange rate and the purchasing power parity.

Ostensibly, the French monetary authorities also tried the traditional instrument, the discount rate. The discount rate of the Bank of France was raised from 5 per cent (the rate that had prevailed since February 1922) to only 5½ per cent on January 10 and to 6 per cent on January 17, 1924, although the speculative attack on the franc had started in November 1923. Furthermore, as pointed out above, the effectiveness of changes in the discount rate was destroyed by the presence of a large floating debt; money was always readily available to the public and commercial banks simply through not reinvesting the proceeds received for the redemption of maturing *bons*. Thus, although the discount rate was raised to 6 per cent in January and there was already a feverish speculative scramble for foreign exchange, the call loan rate in Paris was 4.31 per cent in January, 4.56 per cent in February, and 3.81 per cent in March 1924, compared with 5.50 per cent in October, 4.69 per

[16] League of Nations, *op. cit.*, p. 61.

cent in November, and 4.31 per cent in December 1923, prior to raising the official discount rate.[17]

Because of the government policy of maintaining fixed interest rates on the *bons*, the Bank of France was forced to expand enormously its supply of credit in response to the increased demand for funds directly or indirectly engendered by the speculative demand for foreign assets. This is shown by the movements of the assets and liabilities of the Bank of France during this crucial period (Table 5). Commercial bills

TABLE 5. ASSETS AND LIABILITIES OF THE BANK OF FRANCE PRIOR TO AND DURING THE EXCHANGE CRISIS OF EARLY 1924

(In millions of French francs)

	End of 1922	End of 1923	End of March 1924	Changes: End 1922 to end 1923	Changes: End 1923 to end March 1924
Assets					
Metallic reserve at home and other reserve items	3,961.3	3,973.8	3,976.5	+12.5	+2.7
Assets in and claims on foreign countries	2,437.0	2,440.0	2,443.8	+3.0	+3.8
Commercial bills	1,990.8	3,245.1	5,360.1	+1,254.3	+2,115.0
Securities and investments	251.2	252.1	272.9	+0.9	+20.8
Loans and advances	30,501.6	30,497.1	30,031.2	− 4.5	− 465.9
To the Government	*28,355.0*	*28,083.0*	*27,551.0*	*− 272.0*	*− 532.0*
On government securities	*2,133.7*	*2,401.2*	*2,480.2*	*+267.5*	*+79.0*
Other	*12.9*	*12.9*	—	—	*− 12.9*
Sundries	2,129.8	2,457.7	3,499.8	+327.9	+1,042.1
Total	41,271.7	42,865.8	45,584.3	+1,594.1	+2,718.5
Liabilities					
Capital	182.5	182.5	182.5	—	—
Notes in circulation	35,953.0	37,763.0	39,949.6	+1,810.0	+2,186.6
Current accounts	2,344.3	2,255.6	3,242.0	− 88.7	+986.4
Government	*10.3*	*21.4*	*18.8*	*+11.1*	*− 2.6*
Other	*2,334.0*	*2,234.2*	*3,223.2*	*− 99.8*	*+989.0*
Other deposits[1]	1,382.5	1,359.7	777.8	− 22.8	− 581.9
Sundries	1,409.4	1,305.0	1,432.4	− 104.4	+127.4
Total	41,271.7	42,865.8	45,584.3	+1,594.1	+2,718.5

Source: League of Nations, *Memorandum on Currency and Central Banks, 1913–1924* (Geneva, 1925), Vol. II, p. 59.

[1] Chiefly government deposits in the "Amortization Account."

discounted by the Bank of France increased by F 2,115.0 million during the first quarter of 1924, in contrast to an increase of only F 1,254.3 million for the whole year 1923. Mainly as a consequence of this, notes in circulation expanded by F 2,186.6 million during the first quarter of 1924, compared with an increase of F 1,810.0 million during the whole preceding year; and nongovernment current accounts at the Bank of France increased by F 989.0 million, compared with a decrease

[17] International Conference of Economic Services, *International Abstract of Economic Statistics, 1919–1930* (London, 1934), p. 70.

of F 99.8 million during the preceding year. The total money supply from the Bank of France (i.e., note circulation plus nongovernment demand deposits) therefore increased by F 3,175.6 million during the quarter, compared with an increase of F 1,710.2 million for the whole year 1923.

The enormous increase in commercial bills was really a disguise for the expansion of advances to the Government by the Bank. From 1921, the Government had been nominally trying to carry out the 1920 Convention, which prescribed that the Treasury should repay F 2 billion annually to the Bank of France to reduce the outstanding advances from the Bank to the Treasury, and the legal limit of the Bank's advances to the Treasury had been reduced year by year up to April 1925. However, as the budget continued to be in deficit, the Government was forced to borrow from other sources to maintain itself in the false position of paying off these advances. In the first year after the Convention, i.e., 1921, the rapid increase in the sales of *bons de la défense nationale* provided sufficient funds to repay the advances according to the Convention. In 1922, however, the amount of *bons* outstanding started to decline,[18] and the Government was forced to resort to such subterfuges as borrowing from private banks and then compelling the Bank of France to provide the funds to those banks from which it borrowed. For example, while provisional advances to the Government by the Bank of France decreased from F 23,800.0 million at the end of 1922[19] to F 23,100.0 million at the end of March 1923, there was at the same time an almost exactly corresponding increase, from F 1,990.8 million to F 2,684.9 million, in the so-called commercial bills held by the Bank.[20]

It is therefore highly probable that the abnormal increase of F 2,115.0 million in bills discounted with the Bank of France, in the midst of a speculative attack on the franc (this time without a corresponding decrease in loans and advances to the Government or in government securities, which together decreased by only F 453 million), was largely the result of government borrowings from private banks in order to

[18] For figures indicating the amount of the decline, see E. L. Dulles, *op. cit.*, Table IV, p. 94, and Table XII, p. 186. Data on the net excesses of new issues over redemptions of all short-term *bons*, 1920–26, are given in Ministère des Finances de la République Française, *op. cit.*, p. 572. From these sets of data, it is clear that after 1922 the net amount of short-term *bons* outstanding declined every year until 1926, and that the decline in 1925 was particularly heavy.

[19] The figure of F 28,355.0 million for loans and advances to the Government in Table 5 covers F 23,800.0 million of provisional advances to the Government, F 200.0 million of statutory advances to the Government, and F 4,355.0 million of Treasury bills discounted for advances by the State to foreign governments.

[20] League of Nations, *Memorandum on Central Banks, 1913 and 1918–1923* (Geneva, 1924), pp. 180–83.

cope with the increased net demand for redemption of short-term *bons* issued at fixed interest rates at a time when foreign exchange assets were generally expected to appreciate in terms of the franc and hence became a more attractive object of investment than domestic bills and bonds.

After the cumulative speculative demand for foreign exchange had been reversed on March 12 by massive government intervention with the proceeds of two loans from abroad and by the passage of the so-called *double-décime* tax measure which restored confidence, commercial bills discounted with the Bank of France declined. At the end of June 1924, the amount of commercial bills shown in the Bank's return was F 3,697.0 million, that is, F 1,663.1 million lower than at the end of March. The money supply from the Bank of France also declined, from F 43,172.8 million at the end of March to F 41,801.9 million at the end of June. This decline cannot be attributed to the sales of foreign exchange by the Government at the peak of the crisis, for, as has been pointed out, the French Government had already recouped by the end of April all the exchange previously sold and had reconstituted all the original loans. This decline was obviously the result of the same mechanism, now operating in reverse, that brought about the previous sharp increase in the money supply. With foreign exchange assets no longer expected to appreciate and domestic prices starting to decline, it once more became attractive to hold domestic securities with fixed yields. As the public bought more *bons* from the Government, the Government was able to reduce its borrowings from the private banks, and the latter in turn were able to reduce their discounts with the Bank of France.

The demand deposits of the commercial banks in France showed a similar pattern of rapid increase during the speculative attack on the franc after November 14, 1923 and then a decline after the speculative tide had turned (on March 12, 1924). The demand deposits of the four big French commercial banks that published monthly statements[21] showed an increase of F 1,335 million (or 9.4 per cent) from the end of November 1923 to the end of February 1924, compared with an increase of only F 277 million from the end of 1922 to the end of November 1923. By the end of March, when the franc had started to recover sharply, the amount of demand deposits was already slightly lower than at the end of February. At the end of May, it had declined to approximately the same level as at the end of December 1923 (Table 6).

[21] The four banks were the Société Générale, Crédit Lyonnais, Comptoire d'Escompte de Paris, and Société Générale de Crédit Industriel et Commercial.

TABLE 6. MONEY SUPPLY BEFORE AND AFTER THE 1924 EXCHANGE CRISIS IN FRANCE

(Columns 1–4 in billions of French francs)

End of Period	Note Circulation (1)	Nongovernment Current Accounts at Bank of France (2)	Demand Deposits of Four Leading Commercial Banks (3)	Col. 1 + Col. 3 (4)	Dollar Exchange Rate as Per Cent of Par (5)
1922	36.4	2.3	14.0	50.4	268
1923					
Oct	37.7	2.0	14.4	52.1	324
Nov	37.3	2.2	14.2	51.5	350
Dec	37.9	2.4	14.9	52.8	368
1924					
Jan	38.8	2.3	15.1	53.9	414
Feb	39.8	2.3	15.6	55.4	437
Mar	39.9	3.2	15.5	55.4	412
Apr	39.8	2.4	15.2	55.0	313
May	39.6	2.2	15.0	54.6	333
Jun	39.7	2.1	15.4	55.1	367

Sources: International Conference of Economic Services, *International Abstract of Economic Statistics, 1919–1930* (London, 1934), and Eleanor Lansing Dulles, *The French Franc, 1914–1928* (New York, 1929), statistical appendix.

It is not difficult to see why speculation on the French foreign exchange market during the crisis of 1924 tended to be self-aggravating. The basic reason was the extremely high elasticity of the supply of money and credit in France resulting from the presence of a large amount of floating government debt redeemable at fixed rates of interest. Whenever the expected rate of appreciation of foreign exchange exceeded the fixed interest yield of domestic short-term bills (*bons*), speculators would demand redemption of their *bons* by the Government, and the latter would have to force the banking system to create more money to fulfill its obligations. The new money and credit would pass into circulation through the exporting industries or other suppliers of foreign exchange and would drive up prices. The rise in domestic prices would create an expectation of further appreciation of foreign exchange and lead to further flight of capital from domestic fixed interest securities to foreign exchange assets, which in turn would automatically call forth further creation of money and credit. Thus, the vicious cycle of speculation, inflation, and depreciation would be set in motion. This is only a particular case of the process of cumulative expansion as described by Wicksell: according to him, such an expansion would occur whenever the natural rate of interest might rise, for any reason whatsoever, above the money rate of interest that is pegged by the banking system with an elastic supply of credit.

The second and even more violent franc exchange crisis from 1925 to 1926 was essentially a repetition of the same story. The stiff increase in taxes voted during the early 1924 crisis brought about a considerable

improvement in the government budget. Whereas in 1922 and 1923 the budget deficits were F 7.2 billion and F 5.6 billion, respectively, the deficits in 1924 and 1925 were F 3.3 billion and F 1.5 billion, respectively.[22] Wholesale prices remained fairly stable from April 1924 to May 1925. The franc exchange rate was also relatively stable from June 1924 to May 1925.

In April 1925, however, certain incidents occurred which profoundly shook the public's confidence in the soundness of the Government's finances. France was then involved in hostilities in Morocco which constituted a financial drain. Attempts by various ministries to increase revenue were repeatedly defeated in the legislature. The Government was forced to continue the subterfuge described above of obtaining concealed advances from the Bank of France. As a result of these advances, the note circulation of the Bank of France rose in excess of its legal limit. The weekly statement of the Bank published on April 9 showed a note circulation of more than F 43 billion, F 2 billion in excess of the limit which had been set on September 28, 1920 and which had not been changed. This scandal caused the downfall of the Herriot Ministry and made known to the general public that the French Treasury was practically without funds. This, added to the proposal of a 10 per cent capital levy by the Herriot Ministry, could not but shake the confidence of the public in government securities. The decline in the amount of short-term *bons* outstanding, which had started in March 1925, was greatly speeded in April (during that month alone the decline was F 1.7 billion) and continued all through 1925. For the year as a whole, the decline was nearly F 9 billion. To meet the enormous demand for redemption and to avoid default on these *bons*, the Government had to request the legislature repeatedly to raise the legal limit of the Bank of France's advances to the Government, and the Bank of France had to increase its note circulation correspondingly. The relations between the *bons* outstanding, the advances to the Government, and the note circulation of the Bank of France and other related data are shown in Table 7. The F 8.8 billion excess of redemption over new issues of *bons* in 1925, plus a moderate budget deficit of F 1.5 billion and a F 3 billion reduction in the government long-term debt,[23] led to an almost exactly corresponding increase in provisional advances to the Government by the Bank of France. The Bank of France's note circulation increased by F 10.5 billion (or 26 per cent), and nongovernment current accounts at the Bank increased by F 1.3 billion during the same year.

[22] According to Ministère des Finances de la République Française, *op. cit.*, p. 230, the budget deficits of the French Government for the years 1923–25 were as follows: 1922, F 7.2 billion; 1923, F 5.6 billion; 1924, F 3.3 billion; 1925, F 1.5 billion. In 1926, there was a surplus of F 1.1 billion.

[23] *Ibid.*, p. 572.

TABLE 7. BONS DE LA DÉFENSE NATIONALE OUTSTANDING, ASSETS OF THE BANK OF FRANCE, AND MONEY SUPPLY IN FRANCE BEFORE AND AFTER THE 1926 EXCHANGE CRISIS

(*Columns 1–7 in billions of francs*)

End of Period	*Bons de la Défense Nationale* Outstanding (1)	Provisional Advances by Bank of France to Government (2)	Bills Discounted by Bank of France (3)	Notes in Circulation (4)	Nongovernment Current Accounts at Bank of France (5)	Demand Deposits in Four Commercial Banks (6)	Col. 4 + Col. 6 (7)	Cost of Dollar in Terms of Franc (as per cent of par) (8)
1924								
Dec	54.5	22.6	5.2	40.6	2.0	14.9	55.5	357
1925								
Jan	54.9	21.2	5.9	40.5	2.0	15.0	55.5	358
Feb	55.0	21.9	5.1	40.8	1.9	15.1	55.9	365
Mar	53.9	21.8	5.6	40.9	2.0	15.3	56.2	372
Apr	52.2	23.3	6.0	43.0	1.9	15.3	58.4	372
May	51.2	23.9	4.6	42.7	1.9	16.4	59.1	374
Jun	50.6	25.7	3.8	43.0	2.1	16.9	59.9	405
Jul	50.7	27.3	3.6	44.5	2.5	17.6	62.1	411
Aug	50.3	27.8	3.5	44.7	2.4	17.7	62.4	411
Sep	51.2	28.9	3.2	45.6	2.1	18.9	64.5	409
Oct	46.6	30.0	3.6	46.8	2.3	19.0	65.8	435
Nov	45.8	32.0	3.6	48.1	2.5	19.3	67.4	487
Dec	45.7	36.0	4.2	51.1	3.3	19.9	71.0	516
1926								
Jan	46.1	34.2	3.4	50.6	3.2	20.7	71.4	512
Feb	46.1	34.5	3.4	51.0	2.9	20.9	71.9	524
Mar	45.8	35.0	3.3	51.5	2.7	20.5	72.0	539
Apr	46.2	35.2	4.2	52.2	2.7	20.5	72.7	568
May	46.4	35.9	4.6	52.7	2.8	21.4	74.2	612
Jun	46.2	36.6	4.7	53.1	2.8	22.4	75.5	655
Jul	44.2	37.5	6.7	56.0	3.2	23.3	79.4	782
Aug	46.0	36.5	5.8	55.1	3.4	22.7	77.8	681
Sep	46.9	36.7	5.9	55.0	2.9	22.1	77.1	677
Oct	46.9	35.8	5.4	54.6	2.9	23.1	77.7	657
Nov	48.5	35.7	4.4	53.3	3.7	22.1	75.4	665
Dec	49.1	36.0	4.4	52.9	5.3	22.5	75.4	488

Sources: Eleanor Lansing Dulles, *The French Franc, 1914–1928* (New York, 1929), p. 186 and statistical appendix, and International Conference of Economic Services, *International Abstract of Economic Statistics, 1919–1930* (London, 1934).

The expansion of money supply and credit continued in 1926, as successive short-lived ministries failed to produce any solution for the financial difficulties of the Government, and especially for the problem of the floating debt and of restoring the public's confidence. From the end of 1925 to the end of July 1926 (the cost of dollar exchange reached a peak on July 20), the *bons de la défense nationale* outstanding declined by another F 1.5 billion; provisional advances to the Government increased by F 1.5 billion, bills discounted by the Bank of France by F 2.5 billion, and note circulation by F 4.9 billion.

This time, the Bank of France did not even try to use the traditional instrument of the discount rate. In fact, it lowered its rate from 7 per cent (which had been established in December 1924) to 6 per cent in July 1925 and held it at that level until July 1926, when the exchange

market had already reached the stage of panic. The market rates of interest (the call rate and the discount rate for prime commercial paper) did not change substantially during this period (Table 8). To

TABLE 8. RATES OF INTEREST IN FRANCE BEFORE AND AFTER THE 1926 EXCHANGE CRISIS

(*In per cent*)

	1925		1926		
	Official discount rate	Call rate	Official discount rate	Private discount rate for prime commercial paper	Call rate
Jan	7.0	4.81	6.0	4.4	3.63
Feb	7.0	4.69	6.0	4.4	4.63
Mar	7.0	4.75	6.0	4.4	4.88
Apr	7.0	3.87	6.0	4.5	3.32
May	7.0	4.69	6.0	5.2	5.0
Jun	7.0	4.38	6.0	5.5	6.25
Jul	6.0	3.50	7.5	5.7	7.44
Aug	6.0	5.12	7.5	6.0	4.94
Sep	6.0	5.06	7.5	7.0	6.0
Oct	6.0	3.88	7.5	7.25	9.25
Nov	6.0	4.88	7.5	6.25	4.50
Dec	6.0	5.13	6.5	5.0	3.13

Source: International Conference of Economic Services, *International Abstract of Economic Statistics, 1919–1930* (London, 1934), p. 70.

meet, at more or less stable rates of interest, the rising demand for funds stimulated by the rapidly rising internal prices and the prices of foreign exchange assets, the commercial banks rapidly expanded their credit. Thus the deposits of the four leading commercial banks increased by F 5.0 billion during 1925 and by another F 3.4 billion during the first seven months of 1926—in all, an increase of 57 per cent over deposits at the end of 1924.

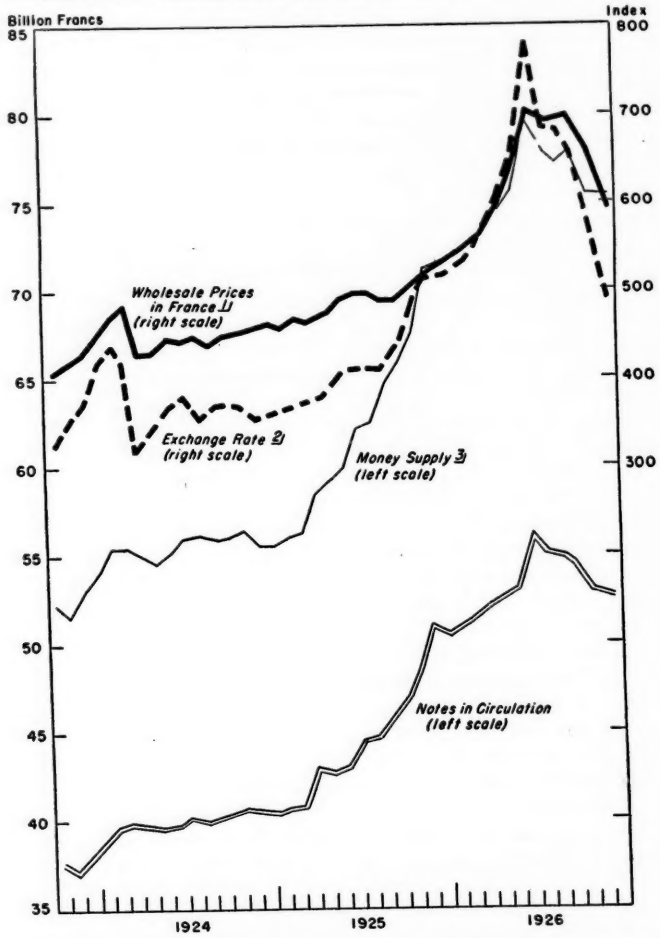
The franc plummeted with the downfall of the Briand Ministry (on July 17) and the accession to the premiership of Herriot, whose renewed proposal of a capital levy was again defeated on July 21. The tide was turned with the call of Poincaré to power. The residue of the dollar loan obtained from J. P. Morgan and Co. during the 1924 crisis was given at once to the Treasury to meet its day-to-day needs.[24] This no doubt had an immediate stabilizing effect on the exchange rate. On July 27, a stabilization plan embodying the recommendations of the Committee of Experts—a three-stage stabilization plan consisting of (1) elimination of the budget deficit by increasing indirect taxation, (2) *de facto* stabilization by pegging, and (3) *de jure* stabilization—

[24] Part of this loan was used to peg the rate from July to September 1925.

was pushed through a chastened legislature. Confidence in the future of the franc and in government securities returned. The public once more became willing to hold fixed interest government securities and began to liquidate their excessive speculative holdings of foreign exchange assets, which were now expected to depreciate. Money started to flow out of circulation and back to the banks, and bank credits created during the preceding speculative fever were being paid off. From the end of July 1926 to the end of the year, *bons de la défense nationale* outstanding increased by F 4.9 billion; advances to the Government by the Bank of France decreased by F 1.5 billion; bills discounted with the Bank of France fell by F 2.3 billion; notes in circulation decreased by F 3.1 billion; and demand deposits of the four commercial banks decreased by F 0.8 billion. The franc recovered rapidly from the low point of F 49.22 per U.S. dollar, quoted on the Paris Bourse on July 20, to around F 25 in mid-December. When the Bank of France then decided to peg the rate at around F 25.25, it was obliged to buy the surplus supply of foreign exchange with an additional note issue.

The lesson to be learned from the French experience of 1924 and 1926 is the inevitable instability of a monetary system with rigid interest rates maintained by an almost infinitely elastic supply of money and credit. The violent depreciation of the franc from 1925 to 1926 and the preceding one from 1923 to 1924 are illustrations *par excellence* of the cumulative expansion shown by Wicksell to be inevitable under such a monetary system. Even if the French exchange system had then been a fixed rate system with strict and effective exchange controls (but not supported by unlimited reserves), the monetary and fiscal practices that were followed would still have been likely to generate a cumulative expansion involving ever-rising internal prices. Even if dealings in foreign exchange had been under the strictest possible control, the political disturbances that had shaken public confidence in government securities in the early part of 1925 would still have been able to induce the French public to shift their capital from short-term *bons* to such assets as real estate, commodities, or industrial shares. The public's refusal to renew their holdings of short-term *bons* at constant interest rates would have automatically drawn additional money into circulation, and prices of all commodities and all assets, whose values and yield could be expected to rise with the general price level, would have been driven up. The general rise in prices would have provided a further incentive to shift capital from fixed interest securities, which in turn would have drawn more money into circulation. Thus, the instability of the French franc from 1923 to 1926 was the result of an extremely elastic money supply, which would have caused

CHART 4. WHOLESALE PRICES AND MONEY SUPPLY IN FRANCE AND EXCHANGE RATE OF FRENCH FRANC BEFORE AND AFTER 1924 AND 1926 EXCHANGE CRISES



Sources: League of Nations, *Memorandum on Currency, Memorandum on Currency and Central Banks,* and *International Statistical Year-Book.*

[1] Federal Reserve Board index of wholesale prices in France (1913 = 100).

[2] Cost of dollar in French francs as percentage of par.

[3] Note circulation plus demand deposits in four leading commercial banks.

great instability in the economy whether the exchange rate was freely fluctuating or controlled. It therefore should not be regarded as evidence that a freely fluctuating exchange rate can, as a general rule, be expected to lead to cumulative depreciation through self-aggravating speculative capital movements regardless of the elasticity of the money supply and the flexibility of the interest rate.

As shown in Chart 4, the correlations between the money supply[25] and the exchange rate and between the money supply and wholesale prices are both very striking. For the period September 1923–November 1926, which includes the two exchange crises up to the commencement of stabilizing operations by the Bank of France in December 1926, the coefficient of correlation between the money supply and the exchange rate of the franc is 0.94, and that between the money supply and the wholesale price index is 0.93. Although statistical correlation does not definitely prove the existence of causal relationship one way or the other, such clearly observable parallel movements cannot but emphasize the important role played by the elastic money supply during the two French exchange crises.

[25] Notes in circulation plus demand deposits in four leading commercial banks.

Central Bank Policies and Inflation

A Case Study of Four Less Developed Economies, 1949-57

Joachim Ahrensdorf *

MOST OF THE LESS DEVELOPED ECONOMIES have been subject during the postwar period to inflationary pressures of various degrees of intensity. As a rule, these pressures emanate from attempts by one or more sectors of the economy to secure a larger share of the total product. The primary motivations for such attempts are the desire of either the public sector or the private sector, or both, to undertake additional investments and to put the burden of the required additional saving on the other sector. However, the attempt of any one sector, once made effective, tends in turn to induce defensive reactions of other sectors that want to maintain their share in the total product, not only for investment but also, especially on the part of the government and of wage and salary earners, for consumption. These defensive reactions usually intensify the inflationary pressures. Moreover, they tend to re-establish the prior distribution of the total product and thus defeat any one sector's attempt to increase its share.

One facet of the development process in countries with such economies has been the emergence of monetary systems which facilitate monetary management, with the objective of maintaining stability and promoting economic development. Chronic inflation is evidently incompatible with the objective of stability. Moreover, as chronic inflation could not occur without continued excessive monetary expansion, it is an indication that central banks play an important role in the generation of inflationary pressures. Their role may be considered to be active even when they only respond to demands for money from other sectors, which attempt to increase or maintain their share in the total product.

This raises the question of the ability of central banks to determine what amount of money is compatible with stability, to maintain this

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amount of money, and to facilitate a transfer of real resources from one sector to another by distributing the total "safe" amount of credit among competing sectors.

In this context, the existence of a "safe" rate of monetary expansion will be assumed. Attention will be focused rather on the ability of central banks to control effectively the over-all volume of money and to distribute it. The objective of stability evidently requires that, when aggregate output is inelastic, an expansion of credit to one sector be compensated by a contraction of credit to another sector. If monetary authorities should be found to be unable for technical reasons to take such compensating action, changes in the legal and institutional framework would be necessary. The enforcement of an effective monetary policy may call for the invention of new tools adapted to the particular setting or for an appropriate change in the setting. If monetary authorities are equipped with a set of modern tools, their use may nevertheless prove ineffective because of structural and psychological factors characteristic of less developed countries. If monetary authorities have the technical capacity to compensate for excessive credit expansion, chronic inflation would be an indication of their unwillingness to use that capacity. Since "refraining from doing" is just as much a policy as "doing," it may be useful to inquire into the reasons for not wishing to compensate when it is possible to do so.

In this paper, the experiences of four countries (Indonesia, Mexico, Nicaragua, and Paraguay) which were subject to chronic inflation during 1949–57 are reviewed. An attempt will be made to show how far central banks mitigated or contributed to inflationary pressures; the potential scope for a more effective monetary policy and the reasons for failure to implement such a policy will then be evaluated.

Since this paper is concerned with monetary rather than with general public policies in relation to inflation, it is assumed that changes in central bank assets in the form of claims on government and of foreign assets are autonomous. This assumption is made in order to limit the discussion to rediscount policy, variable legal reserve requirements, and selective credit controls as anti-inflationary instruments.[1] To put it negatively, the assumption makes it possible to disregard the relationship between central banks and governments as well as the link between domestic monetary developments and changes in foreign balances.[2]

[1] Since open market sales of securities are usually not possible in less developed countries, changes in central bank claims on government in these countries reflect, as a rule, fiscal operations.

[2] The primary monetary effects of increases in foreign assets are, of course, the same as those of increases in claims on government or the private sector. The

The limitation of the discussion to monetary policy in a narrow sense requires the elimination of one further complication. In most of the countries reviewed, the commercial banking system is composed of government-owned, privately owned, and jointly owned institutions. Moreover, borrowing enterprises are frequently owned jointly by governments and private persons, or even owned completely by governments, without, however, necessarily being called "official entities." It is, therefore, conceptually and statistically difficult, if not impossible, to draw a clear line between credit to the public and credit to the private sector.[3] In view of this problem and of the unavailability of detailed data, the analysis in this paper will employ (unless otherwise specified) the concept of "private sector" as used in the International Monetary Fund publication, *International Financial Statistics*. This means that partly or even completely government-owned enterprises which are not defined as official entities may, to some extent, be included as final private borrowers. This approach, which draws a line between central bank transactions with the government proper, on the one hand, and the indirect financing of activities of enterprises that are partly or completely government-owned, on the other hand, may appear arbitrary and unrealistic. With existing data it is, however, the only one feasible for analytical purposes if the scope for purely monetary measures is to be explicitly distinguished from general public policies in relation to inflation.

In Nicaragua and Paraguay, central bank credit furnished more cash to banks and the private sector than to the government. In Indonesia and Mexico, the primary expansion in money that was due to the autonomous factors (changes in claims on government and foreign assets) exceeded, on the average, that of central bank credit to banks and the private sector. The autonomous primary expansion also exceeded the estimated safe rate. In those two countries, monetary stability would have required a contraction of central bank credit to banks and the private sector; in Nicaragua and Paraguay, a lower rate of central bank credit expansion to banks and the private sector would have been necessary. On the average, secondary credit expansion by the

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former represent additional real resources, however, while the latter do not. Therefore, as a first approximation, increases in domestic assets will generate inflationary pressures through both primary and secondary monetary expansion, but increases in foreign assets only through the secondary expansion that they may make possible.

[3] A series of operations is conceivable in which a central bank lends to a commercial bank, 51 per cent of whose capital is owned by the government, and the commercial bank in turn lends to an enterprise, 40 per cent of whose capital is owned by the government. In such circumstances, it is difficult to determine how much credit went to the private sector and how much to the public sector.

banking system was relatively most significant in Nicaragua and Mexico; in Indonesia and Paraguay, it was insignificant or absent.

Reserve requirements were changed most frequently in Mexico. Central bank rediscount rates were changed only in Nicaragua. In general, the tools available for restraining secondary credit expansion were not employed to the extent that was technically possible. In Indonesia and Nicaragua, imposition and/or variations of reserve requirements were initially precluded by statutory limitations. Yet, after these limitations were gradually modified, the implementation and enforcement of restrictive measures followed only slowly. When such measures were made effective, they were frequently counteracted, if not overcompensated, by offsetting changes in the credit multiplier and in the income velocity. When changes in those factors were not of an offsetting type, a fairly determined implementation of restrictive measures, mostly a reduction in rediscounting combined with the raising and enforcing of reserve requirements, succeeded in reducing credit to the private sector. This appears to have happened in Nicaragua and in Paraguay in 1956–57.

In spite of institutional limitations, monetary measures could, in two of the four countries reviewed, Nicaragua and Paraguay, have succeeded in preventing continuous inflation. In Indonesia and Mexico, central bank action could have reduced the rate of inflation. The potentially most effective restrictive tool would have been greater restraint in central bank rediscounting for banks and the private sector. During some periods, the exercise of the required degree of restraint might have had adverse effects on output and the utilization of productive capacity, mainly because of the agricultural sector's heavy reliance on credit.

The unwillingness of the monetary authorities to use restrictive tools more vigorously was due mostly to apprehensions regarding the output effects of a reduction in the rate of credit expansion and, *a fortiori*, of a reduction in the volume of credit.

To some extent, the reluctance of the monetary authorities to apply greater restraint may have been due to their feeling that a severe restrictive policy toward the private sector, including banks, was politically impossible and therefore would have tended to jeopardize their standing and power in the community.

There are indications that in most of the countries reviewed gradual changes in the legal and institutional framework were slowly followed by a more determined implementation and enforcement of restrictive monetary measures. In addition, further improvements in the efficacy of monetary policy in still predominantly agricultural economies may

depend on the extent to which the present inflexibility of credit policy can be reduced. This may require the growth of capital markets and credit institutions outside the monetary system, i.e., nonbank financial intermediaries which derive their resources from genuine savings.

Degree and Sources of Inflation

Each of the countries reviewed in this paper is generally considered to be a less developed country. All have made efforts of various degrees of intensity to raise the rate of economic development. They have currency systems that are *de facto* managed, i.e., they have monetary institutions which have at their disposal devices that enable them to influence the cost and availability of money and credit. In most of them, the legal framework for monetary policy was extended and strengthened during the period under review, 1949–57.

In all four countries, both the cost of living and the money supply increased almost continuously. The average annual rate of increase in prices was highest in Paraguay (47 per cent) and in Indonesia (17 per cent); in Mexico the average rate of increase was 8 per cent and in Nicaragua, 7 per cent (Table 1). Except in Paraguay, where the income

TABLE 1. CHANGES IN COST OF LIVING AND MONEY SUPPLY, AND FACTORS AFFECTING CHANGES IN MONEY SUPPLY, IN FOUR COUNTRIES, 1949–57[1]

(Annual averages in per cent)

	Change in Cost of Living[2]	Change in Money Supply[3]	Increase in Government Net Borrowing from Banking System[4]	Bank Credit Expansion to Private Sector[5]	Increase in Foreign Assets	Other[6]
			(as percentage of money supply at beginning of year)			
Indonesia	17	25	24	8	5	−10
Mexico	8	14	2	8	9	−6
Nicaragua	7	13	−5	22	6	−9
Paraguay	47	41	10	38	...	...

[1] Based on data from International Monetary Fund, *International Financial Statistics* (*IFS*).
[2] Annual average data were used to compute changes from year to year.
[3] End-of-year data were used to compute changes from year to year.
[4] The increase in the monetary system's claims on government less government deposits is taken as the cash deficit and is compared with the money supply at the beginning of the year. For Nicaragua and Paraguay, claims on official entities are included.
[5] For Mexico, claims on related institutions (government and private mortgage banks) are included.
[6] This is the change, as a percentage of the money supply at the beginning of the year, of the sum of the remaining items as given in the Monetary Survey in *IFS:* unclassified assets less quasi-money and unclassified liabilities. Prepayments for exchange are included for Indonesia, Nicaragua, and Paraguay, and counterpart funds for Indonesia.

velocity rose almost continuously, the annual average percentage increase in the money supply exceeded the percentage increase in prices. The two countries with the highest rate of inflation showed the closest correspondence between the increase of money and the increase of prices. In both these countries, currency in circulation also expanded at a higher rate than the money supply, i.e., the ratio of currency to total money supply tended to rise, while in Mexico it declined.

Toward the end of the period, i.e., after 1955, the rate of increase in prices declined in Indonesia and Paraguay, and in Nicaragua prices actually fell. The highest increases in prices during any one year ranged between 123 per cent (Paraguay in 1952) and 16 per cent (Mexico in 1955). The lowest increases ranged from minus 4 per cent (Nicaragua in 1956) to plus 16 per cent (Paraguay in 1957).

Government cash deficits and credit expansion to the private sector were the major inflationary factors. In all countries except Nicaragua, the fiscal operations of the government had a net inflationary effect. In Indonesia, the expansionary effect of government cash deficits exceeded that of credit expansion to the private sector in all years during the period under review except in 1951, when government revenues rose substantially because of the boom related to the Korean war. For Mexico, the small average percentage of government cash deficits in the increased money supply shown in Table 1 tends to understate the credit obtained by the public sector, while the relatively large percentage for foreign assets tends to overstate increases in gold and foreign exchange resources.[4] If this qualification is allowed for, credit to the public sector appears to have been on the average the most significant source of monetary expansion in Mexico as well. In Paraguay and Nicaragua, credit expansion to the private sector was the principal single cause of increases in the money supply.

Increases in foreign assets had, on the average, an expansionary effect in all four countries. The average annual contractionary effect of other absorption factors (representing the excess of changes in quasi-money, unclassified liabilities, prepayments in foreign exchange, and counterpart funds, over changes in unclassified assets) ranged from minus 6 per cent in Mexico to plus 10 per cent in Indonesia.

On the assumption that central banks cannot control the primary monetary effects of fiscal operations and of changes in foreign assets, the scope for monetary policy is limited to central bank credit exten-

[4] It appears that devaluation profits in general were credited to the government, which applied the proceeds to the cancellation of the indebtedness of state banks to the central bank. While this operation enabled state banks to write off bad loans, mostly to the agricultural sector, it did not reduce the monetary liabilities of the central bank.

sion to banks and directly to the private sector and to the control of secondary credit creation by the banking system. A review of the activities of central banks in these two respects will show to what extent they contributed to, or mitigated, inflationary pressures.

The by-and-large "safe" rate of money expansion may be considered as being related to the average rate of increase in output and the level of, and changes in, income velocity. The increase in monetary liabilities of the central bank that stays within the limits of this safe increase in the money supply is related to the credit multiplier, whose *ex post* order of magnitude is indicated by the ratio of the increase in the money supply to the increase in total monetary liabilities of the central bank.

This is a rather elementary hypothesis which is, of course, subject to many qualifications. When, for instance, unemployed productive resources of all types are available so that aggregate output is highly elastic, the safe expansion rate of money and effective demand will depend on the extent of unemployed capacity and the relative significance of various bottlenecks (including foreign exchange resources). This condition of a highly elastic output in the short run is not, as a rule, found in less developed countries. Or, to mention another qualification, it may be argued that a rise in world market prices may warrant a monetary expansion greater than would be justified by the domestic output/velocity criterion alone. Also, it has been reasoned that the real transfer of international long-term capital requires a monetary expansion and a rise in relative prices in the capital-importing country. These and other still more subtle considerations regarding the safe rate of monetary expansion, such as the enlargement of the monetized sector, cannot serve to explain chronic inflation; therefore, they may be disregarded in this study. The same holds for increases in velocity or in the credit multiplier. While changes in those coefficients are largely autonomous, there are definite institutional limitations to continuous increases.

The extent to which central bank credit to the private sector contributed to inflation and the relevant factors determining this extent are shown in Table 2. The average values for increases in real income, for income velocity, and for the credit multiplier are shown in columns 1, 2, and 3. Average annual increases in the money supply, central bank monetary liabilities, and central bank credit to the private sector are shown in columns 4, 5, and 6. Increases in monetary liabilities (column 5) exceeded increases in central bank credit to the private sector (column 6) in Indonesia and Mexico. In Nicaragua and Paraguay, increases in central bank credit to the private sector were larger than the increases in monetary liabilities; in other words, decreases

TABLE 2. FACTORS DETERMINING SIGNIFICANCE OF CENTRAL BANK CREDIT TO PRIVATE SECTOR AS SOURCE OF INFLATION IN FOUR COUNTRIES, 1949–57[1]

(Annual averages)

	Increase in Real Income (*billions of national currency*)[2] (1)	Income Velocity[3] (2)	Credit Multiplier[4] (3)	Increase in Money Supply (4)	Increase in Central Bank Monetary Liabilities (5)	Increase in Central Bank Credit to Private Sector[5] (6)	"Safe" Increase in Money Supply[6] (7)	"Safe" Increase in Central Bank Monetary Liabilities[7] (8)	"Safe" Change in Central Bank Credit to Private Sector[8] (9)	Excess Increase in Central Bank Credit to Private Sector[9] (10)
				← *(millions of national currency)* →						
Indonesia	5.0	11.0	1.0	1,800	1,800	470	455	455	− 875	1,345
Mexico	3.5	7.7	1.7	971	571	42	455	268	− 261	303
Nicaragua	0.07	8.2	1.7	19	11	20	9	5	14	6
Paraguay	0.4	4.6	1.2[10]	280[10]	237[10]	353[10]	87	73	189	164

[1] Based on data from International Monetary Fund, *International Financial Statistics;* United Nations, *Yearbook of National Accounts Statistics, 1957;* International Bank for Reconstruction and Development, *The Economic Development of Mexico* (1953).

[2] For Indonesia, net domestic product at factor cost, 1951–54; for Mexico, gross national product at market prices, 1948–56; for Nicaragua, annual increases of 7 per cent of gross national product in 1950 assumed, in accordance with estimates of IMF staff; for Paraguay, national income, 1950–56. Except for Nicaragua, all increases in aggregates are shown in terms of 1953 prices.

[3] Average of national income (see footnote 2) at current prices divided by average money supply.

[4] Total increase in money supply during 1949–57 divided by total increase in central bank monetary liabilities minus increase in government deposits during the same period. (Equals col. 4 divided by col. 5.)

[5] For Mexico, central bank credit to banks, related institutions, and private sector; for Nicaragua and Paraguay, central bank credit to commercial banks.

[6] Col. 1 divided by col. 2.

[7] Col. 7 divided by col. 3.

[8] Col. 6 minus (col. 5 minus col. 8).

[9] Col. 6 minus col. 9.

[10] Annual average, 1952–57.

in other central bank assets and/or increases in nonmonetary central bank liabilities partially offset the effects of increases in central bank claims on the private sector.[5] Column 7 shows the estimated "safe" increase in the money supply derived from the increases in real income and the income velocity. The "safe" increase in central bank monetary liabilities (column 8) is estimated by relating the "safe" increase in the money supply (column 7) to the credit multiplier. By comparing this safe increase in central bank monetary liabilities with the actual increase (column 5), one obtains the amount by which central bank credit to the private sector would have had to be adjusted in order to keep the increase in central bank monetary liabilities within the safe limit shown in column 8.

Column 9 indicates the type and order of magnitude of central bank credit operations which would have been required to maintain a reasonable degree of monetary stability. In Indonesia and Mexico, an annual average contraction of central bank credit to the private sector of the amounts shown in Table 2 would have been necessary in order to compensate for the inflationary forces generated by the public sector. As central banks in fact expanded credit to the private sector, their rediscount policies were destabilizing.

In Nicaragua and Paraguay, the primary monetary expansion caused by the autonomous factors fell short of the permissible increase in central bank monetary liabilities. Some expansion of central bank credit to the private sector, of about the average annual amounts shown in column 9, was therefore permissible. But since the central banks increased their credit in excess of those safe amounts, their rediscount policies were in fact overcompensating. The excess expansion was largest in absolute terms in Paraguay and smallest in Nicaragua, as shown in column 10.[6]

In all four countries, the rediscounting operations of the central bank with respect to the private sector contributed to inflationary pressures. These operations were relatively least significant as an inflationary factor in Mexico and Indonesia, and most extensive in Paraguay and Nicaragua.

[5] In Nicaragua, the major offsetting factors were the decline in central bank claims on government on the asset side and increases in capital accounts on the liability side. In Paraguay, they were mostly increases in prepayments for exchange and in capital accounts.

[6] This is also true in relative terms, as shown by the following ratios of column 6 to column 9: Nicaragua, 1.4; Paraguay, 1.9.

Restrictive Policies and Their Effects

In Indonesia, Nicaragua, and Paraguay, the central bank attempted to counteract increases in monetary liabilities by imposing or raising advance deposit requirements for importers. For the most part, these deposits were to be kept at the central bank. The restrictive effects of these requirements were, however, only temporary, as might be expected in view of the limitations of this device, which by its nature can scarcely be more than a stopgap.

The significance of advance deposit requirements as an instrument of credit policy lies in their effects on the *composition* rather than on the *amount* of central bank liabilities. Any increase in central bank assets that is accompanied by increases in advance deposits, that is, in central bank nonmonetary liabilities, will result in smaller increases in central bank monetary liabilities than would occur without the increase in advance deposits. If the expansion effect of continued increases in central bank assets is to be compensated by use of this device, continued increases in advance deposits are necessary. This, however, requires that either imports (in terms of domestic currency) continue to increase or the advance deposit percentages be continuously raised.[7] The limitations of the former approach are obvious. Continued increases in advance deposit percentages, while perhaps technically possible, would soon affect adversely output and employment in industries using imported raw materials and equipment.

For reasons such as this, the central banks found it necessary to reduce advance payment ratios not long after they had been raised—in Nicaragua in 1954 and in Paraguay in 1956. When a rise in advance payment requirements in 1955 resulted in a rather substantial increase in advance payment deposits, the central bank of Indonesia felt compelled to liberalize its rediscounting and to grant special accommodation to importers, in order to prevent stagnation in the supply of goods and to secure a smooth-running procedure for imports. Thus, the restrictive effect of the increase in advance payments was partially offset by an increase in central bank credit to the private sector. When advance payment requirements were substantially reduced in 1957 in connection with an exchange reform, the expansion effect of the resulting decline in advance deposits exceeded the contraction effect of the decrease in the monetary system's claims on the private sector.

In Nicaragua, advance payment deposits showed very moderate

[7] For a more extensive discussion, see Jorge Marshall, "Advance Deposits on Imports," *Staff Papers*, Vol. VI (1957–58), pp. 239–57.

year-to-year changes and had no significant stabilizing or destabilizing effects. In Paraguay, the continued increase in the local currency value of imports during 1951–57, which was due largely to the depreciation of import rates, resulted in continued increases in advance payment deposits and thus a smaller rise in central bank monetary liabilities than, other things being equal, would have occurred otherwise.

If the primary monetary expansion is not kept within the permissible bounds, an anti-inflationary monetary policy should prevent, or at least restrain, secondary expansion by the banking system. The effect of any given primary expansion on the money supply will be determined by the credit multiplier, which is defined as being equal to the reciprocal of $c+r(1-c)$, where c stands for the ratio of currency in circulation to money and r for the legal or customary reserve ratio maintained by banks against deposits. This multiplier is usually considered as a fairly stable *ex ante* coefficient. An approximate *ex post* indication of its magnitude may be obtained by dividing the increase in money during a given period by the increase in the central bank's monetary liabilities during the same period. This coefficient was, for the period 1949–57 as a whole, largest in Nicaragua and Mexico and smallest in Indonesia and Paraguay (Table 2).[8] Accordingly, secondary expansion of credit by the banking system was more significant in the former than in the latter countries.

The credit multiplier, and consequently the scope for secondary credit expansion with given changes in monetary liabilities of the central bank, may increase or decrease with changes in c or r. Monetary authorities are unlikely to have any influence on changes in c—except for the possibility of reducing it indirectly in the long run by encouraging an expansion of the financial and banking system and changes in payments habits and asset preferences. They may, however, influence the multiplier by imposing or changing legal cash reserve requirements against deposits. The imposition of, or changes in, capital/asset ratios and portfolio ceilings may have similar effects, although these devices aim predominantly at the composition of earning assets in bank portfolios rather than at the proportion between earning and nonearning assets.

There are no indications that the central banks of the countries reviewed effectively checked secondary credit expansion. The annual ratios of increases in money to increases in monetary liabilities of

[8] If the coefficient is calculated on the basis of the average ratios of currency to money, and of bank reserves to deposits, slightly different values are obtained without, however, any change in order of magnitude or pattern. The differences in values appear to be due mainly to changes in the nonmonetary liabilities of the monetary system.

central banks do not show any declining tendency, except in Paraguay since 1955 and possibly in Indonesia since 1954. This tendency in these two countries seems to have been due to a rising trend in the ratios of currency to money and of bank reserves to deposits. The latter probably occurred in Paraguay because of a gradually more vigorous enforcement of average and marginal reserve requirements, and in Indonesia because of the imposition of average reserve requirements in 1957.

The monetary authorities made more extensive use of variations in reserve requirements in Mexico than in any of the other countries, in respect not only to commercial and savings banks but also to other credit institutions. During the period 1949–57, reserve requirements were modified eight times. However, the changes in requirements were geared, to some extent, to influence the composition of earning assets of banks in favor of medium-term production loans and government securities.[9] When, for instance, an inflow of short-term capital after the 1949 devaluation increased the liquidity of the banking system, the central bank imposed marginal legal reserve requirements of 100 per cent. But in view of the objective of maintaining medium-term credits to industry and agriculture, banks were permitted specified investments in medium-term production loans and securities of up to 70 per cent of increases in deposits.[10] The rate of credit expansion to the private sector accordingly increased sharply, and, in spite of a government cash surplus, so did the money supply. In 1951, banks were required to keep 100 per cent of increases in deposits in the form of deposits with the central bank, except those banks whose deposit liabilities were less than ten times their capital and reserves. This requirement was offset by a substantial fall in bank reserves, both absolutely and relative to deposits, and a corresponding sharp rise in the credit multiplier and the rate of credit expansion to the private sector. Moreover, central bank purchases of securities in support of prices tended to increase bank liquidity. When the ratio of bank funds sterilized to deposits was increased, as in 1951 and 1955, the credit multiplier rose; and it also rose when the ratio was reduced, as in 1953 and 1957.

In Nicaragua, the first attempt to check secondary credit expansion was made in 1957 through monthly increases in legal reserve ratios for private commercial banks (but not for the banking department of the National Bank, which accounts for about three fourths of total loans and deposits). This measure led to a rise in the cash reserve ratios of

[9] See Banco de México, *Informe al Vigésimanovena Asamblea General Ordinaria de Accionistas* (Mexico, D.F., 1951), p. 23.

[10] See Banco de México, *Informe al Vigésimaoctava Asamblea General Ordinaria de Accionistas* (Mexico, D.F., 1950), p. 21.

banks and, combined with a reduction in central bank rediscounts, reduced credit to the private sector.

In Paraguay, the first reduction of legal reserve requirements for commercial banks in 1954 resulted in a higher rate of secondary credit expansion. Later in the same year, it was attempted to counteract this expansion, as well as a primary credit expansion due to increased rediscounting, by raising advance deposit requirements. In 1957, marginal reserve requirements were imposed for the first time. Indonesia established legal reserve requirements in mid-1957.

Scope for Anti-Inflationary Monetary Policies

How far might the central banks have been expected to succeed in maintaining monetary stability in the four countries here under review? In answering this question it is convenient to distinguish between Indonesia and Mexico, where credit to the public sector was the primary source of inflation, and Nicaragua and Paraguay, where credit to the private sector was the primary source.

Public sector as primary source of inflation

Suppose that in any given country the growth of productive capacity, as the result of a given investment pattern, is expected to permit annual increases in real output of, say, $50 million. Also assume that income velocity is 5 and is constant. Abstracting from the various qualifications stated earlier, monetary stability would call for an annual increase in effective demand of $50 million, or a monetary expansion of $10 million.

If the cash operations of the government and the monetary effects of international transactions are neutral, the monetary authorities could permit a net credit expansion to the private sector of $10 million. Assuming an elastic demand for credit, the central bank could induce this expansion by providing banks with a sufficient amount of excess reserves by, say, increased willingness to rediscount or by a reduction in legal reserve requirements. The necessary amount of additional rediscounts or of percentage decrease in reserve requirements would be indicated by the ratio of currency to money, the legal reserve ratio, and the working reserve ratio which banks customarily maintain.

Suppose the government insists on a cash deficit of $10 million. In that event, on the assumptions postulated above, no net expansion of credit to the private sector would be permissible. This means not only

that there should be no addition to bank reserves by the central bank directly, but also that additions to bank reserves that are due to the cash deficit of the government should be sterilized. If the government spends the $10 million in the form of currency and the currency/money ratio is 50 per cent, $5 million will flow into banks and serve as a basis for a secondary expansion. In order to prevent this, it would be necessary to require 100 per cent reserves against increases in deposits.

If the government insists on a cash deficit in excess of the safe limit of $10 million, the central bank would have to bring about a net contraction of credit to the private sector.

Assume that the government finances a cash deficit of $20 million by borrowing from the central bank. In the absence of any compensating action, the inflationary gap would be $50 million (the increase in money times velocity minus the increase in real income) plus the secondary credit expansion made possible by increases in bank reserves. Marginal reserve requirements of 100 per cent would merely prevent a secondary expansion. For a complete offset, it would also be necessary to reduce the current expenditures of the private sector by $50 million. The only device available to a central bank to achieve this would be through a reduction of outstanding private credit by $10 million.

Such a contraction cannot take place, however, without some lag. If the central bank stops its rediscounting, contraction will become effective only gradually as the securities in its portfolio mature. The higher the average maturity, the more will the contraction lag behind the expansion of deficit-financed government expenditures. Also, the smaller the amount of rediscounts in the central bank's portfolio, the smaller will be the scope for contracting credit by ceasing to rediscount and waiting for the paper held to mature. Similar limitations hold in respect to increases in average legal reserve requirements. The percentage by which average legal reserve requirements would have to be raised is equal to the ratio of the excessive government deficit to the amount of bank reserves. If, for instance, bank reserves are $25 million, the legal reserve ratio is 20 per cent, and the excess deficit is $10 million, the average reserve ratio would have to be raised to 28 per cent.[11] If banks have excess reserves, the increase in the ratio would have to be correspondingly greater. When banks are loaned

[11] Let the excess increase in the money supply (M) be equal to the excess government deficit (G); and let r stand for the legal reserve ratio and R for initial bank reserves (assuming no excess reserves). Then $\Delta M = G$; to offset this increase in M, the money supply would have to be reduced by $\Delta M = \frac{\Delta r}{r} \cdot R$. Therefore, $\frac{\Delta r}{r} \cdot R = G$, or $\frac{\Delta r}{r} = \frac{G}{R}$.

up, they will be able to reduce their loan portfolios in the absence of call loans only gradually as outstanding loans mature. *De facto*, it is therefore irrelevant whether average reserve ratios are raised at once, or gradually, to the necessary level. Moreover, the more important are medium- and long-term loans relative to commercial loans in commercial bank portfolios, the greater will be the lag in the technically possible contraction of credit to the private sector behind the increase in public expenditures.

The amount by which banks will have to reduce their loans in order to recover reserves will be inversely related to the ratio of currency to money. The higher this ratio, the less will banks have to reduce their loans in order to offset a given loss in reserves or an increase in reserve requirements.[12]

The same considerations hold in regard to the establishment of portfolio ceilings or capital/asset ratios *below* the existing levels. The scope for open market sales of securities is even more limited by the narrowness of the capital market and the frequent attempts to prevent security prices from falling in order to encourage investment in securities.

If, during the process of excess government deficit financing, the income velocity should decrease (rise) or the currency/money ratio increase (fall), the inflationary impact of any given cash deficit would be reduced (aggravated).

From these observations it follows that the extent to which central banks are technically able to compensate for cash deficits of governments depends on several conditions, even when it can be assumed that an adequate arsenal of modern weapons is available: (1) the average maturity of paper in their portfolios; (2) the amount of private credit instruments held (which will depend on the extent to which banks borrow from the central bank); (3) the average maturity of private credit instruments held by banks; and (4) the ratios of currency to money and of bank reserves to deposits, and changes in those ratios.

Suppose that the government is determined to increase its share in total resources through continued excessive deficit financing, and the monetary authorities are technically unable (or unwilling) not only to contract credit to the private sector, but also to prevent a secondary credit expansion. The share of the government in the total product will rise, but the rise will be smaller than the desired one. This is so because the rise in prices and money income will partially offset the

[12] For algebraic proof, see Richard Goode and Richard S. Thorn, "Variable Reserve Requirements Against Commercial Bank Deposits," *Staff Papers*, Vol. VII, No. 1, April 1959, pp. 43–44 (Appendix I).

initial rise in government expenditure. The share of the private sector will correspondingly fall, because the increase in private expenditure financed through the secondary credit expansion will necessarily lag behind the initial increase in government expenditure. In other words, the private sector will start spending more *after* prices have begun to rise, while the government started to spend more *before* prices began to move upward. If the government finds that the actual increase in its share is less than the desired increase and, accordingly, further increases its expenditures by the amount of the discrepancy with money borrowed from the central bank, the process will continue until the actual share has become equal to the desired share.

The intensity and duration of the resulting inflationary process will be determined by the magnitudes of the credit multiplier and the income velocity. Evidently, the increases in the money supply that are due to government deficits will be greater, the higher the credit multiplier; and the increases in effective demand and money incomes that are due to increases in money will be greater, the higher the income velocity. If compensating reactions of the private sector result not only in continued secondary credit expansion but also in increases in velocity and a deterioration in the pattern of investment, the inflationary process will be intensified and prolonged. A fall in output resulting from, say, crop failure will have a similar effect.

As shown above, the autonomous factors were the primary source of inflation in Indonesia and Mexico. In Indonesia, the principal source was government borrowing from the central bank; in Mexico, it was a combination of government cash deficits and increases in the local currency value of foreign assets.

In both these countries a stabilizing monetary policy would have required an average annual contraction of central bank credit to banks and the private sector, in Indonesia of 875 million rupiah, and in Mexico of 261 million pesos (column 9 of Table 2). The total contraction required during 1949–57 would have amounted to 7.9 billion rupiah in Indonesia and to 2.4 billion pesos in Mexico. Outstanding central bank credit to the private sector at the end of 1948 was only 100 million rupiah in Indonesia and 1.3 billion pesos in Mexico. Therefore, in both countries, not only a freezing of central bank credit to banks and the private sector, but even its complete liquidation, would have been insufficient to compensate for the expansion effects of the autonomous factors. In addition to complete liquidation, the central banks would have needed to borrow from the public.

It is, of course, arguable that the autonomous sources of expansion, especially the government deficits, might have been smaller if the rate

of inflation had been lower. Thus, a freezing of rediscounts or, still more, *some* reduction in rediscounts outstanding would have reduced the rate of monetary expansion and might have resulted in lower cash government deficits.

In Indonesia, the scope for secondary credit contraction was limited, as the credit multiplier for the period as a whole was unity, though in most years it was greater than 1, and in 1951, as high as 2.8. In Mexico, the scope was greater, with a credit multiplier for the whole period of 1.7, and a maximum of 5.4 in 1951. Accordingly, in both countries it would have been technically possible to limit secondary credit expansion to a greater extent than was actually done.

Until 1953, Indonesia had no legal basis for the imposition of legal reserve requirements. When this basis was provided, the central bank, whose Banking Department is the largest commercial bank in the country, was reluctant to impose requirements because it felt that they would not have checked the lending capacity of the foreign banks which furnished most of the credit to the private sector. Marginal legal reserve requirements were objected to because they might have merely resulted in a further decline of the already low deposit/money ratio, unless the supply of currency was also restricted. This, however, was considered impossible as long as the government produced large cash deficits and made its expenditures mostly in currency. Also it was believed that a restriction of credit would not have affected importers financed by wholesalers, and that a reduction in private credit would have amounted to discrimination in favor of importers financed by nonbank sources. When in 1957 minimum legal reserve requirements were introduced for the first time (30 per cent of demand and time deposits of private banks, exclusive of state banks), the credit multiplier fell below unity for the first time since 1950.

In Mexico, as shown above, changes in legal reserve requirements were used, to some extent, to influence the composition of banks' earning assets. Moreover, increases in reserve requirements were partially offset by autonomous increases in the credit multiplier, while the effect of reductions was reinforced by increases in the multiplier.[13]

Furthermore, in 1951 and 1955, the expansion effects of sharp increases in the credit multiplier were reinforced by increases in the income velocity. Yet, the effective increases in legal reserve requirements in 1951, while immediately offset by a reduction in bank reserves,

[13] A fall in the ratio of currency to money and/or in the ratio of bank working reserves to deposits which bankers *feel* is adequate has twofold effects on the money supply. *De facto,* such a fall amounts to an increase in excess reserves in the same manner as does an increase in central bank monetary liabilities. At the same time, it raises the credit multiplier.

almost wiped out excess reserves in 1952, and thus strengthened the central bank's control over the lending operations of the banking system.

However, in view of a fall in output and employment in almost all sectors, except agriculture, during 1952 and 1953—which was due to a fall in private investment and a reduction in government investment expenditures and resulted in underutilization of capacity in some consumer goods industries—the monetary authorities felt compelled again to relax their credit restrictions.

In both Indonesia and Mexico, restrictions in central bank rediscounts and a more effective use of legal reserve requirements would have reduced the rate of monetary expansion. But in view of the magnitude of the autonomous expansion factors—government deficits and nominal increases in the local currency value of foreign assets—it appears unlikely that monetary measures alone would have succeeded in attaining and maintaining monetary stability.

The attempts of the Mexican authorities to redistribute deposit and savings bank credit through selective reserve requirements and other devices in favor of agriculture and industry appear to have been successful to some extent. The share of these two sectors in current loans of deposit and savings banks increased from 52 per cent in 1948 to 83 per cent in 1954, and then declined to 71 per cent in 1956. This development, however, tended to lengthen the average maturity of assets in the private and central banks' portfolio, and thus reduced the potential speed with which outstanding credit could be contracted.

The persistent and large government cash deficits in Indonesia could be interpreted as an indication that the government attempted to secure a larger share of the total product by deficit spending. There is, however, no clear evidence that the government succeeded in this respect for any length of time. In 1952, when its cash deficit accounted for almost the whole of the monetary expansion, the ratio of government gross expenditure to net domestic product at factor cost rose from 17 per cent to 19 per cent but declined subsequently, to 17 per cent, in 1954. Government gross expenditures at constant prices increased sharply in 1950 (they almost doubled), financed mostly with increased revenues resulting from the Korean war boom. In the following years they tended to decline and in 1956 were less than in 1950 (but greater than in 1948 and 1949).

The reasons for this apparent inability of the government to secure a lasting increase in its share of the national product might be found in a high, although declining, velocity and a highly elastic supply of credit which enabled the private sector to make its defensive reaction effective. The decline in velocity and possibly in the credit multiplier,

on the other hand, tended to mitigate somewhat the inflationary effects of the government deficits.

Private sector as primary source of inflation

In Paraguay and Nicaragua, central bank credit to banks and the private sector was the primary inflationary factor. With the permissible increase in central bank monetary liabilities determined by the average rate of increase in output, the income velocity and the credit multiplier, and the primary expansion effects of the autonomous factors having been less than required, the rate of central bank credit expansion to the private sector and banks exceeded the warranted rate. The excess of actual over required expansion of central bank credit to the private sector was larger in Paraguay than in Nicaragua (see Table 2, column 10).

In Nicaragua, the possibility of reducing the rate of credit expansion by restricting both rediscounts and secondary expansion appears to have been greatest, since on the average one half of bank credit to the private sector was financed by central bank rediscounts and the credit multiplier was relatively high. In Paraguay, in view of a relatively low credit multiplier and the fact that the average increases in central bank credit to banks exceeded increases in bank credit to the private sector, reduced central bank lending to banks was the most promising approach.

The central banks were unable to reduce the net increases in rediscounts—as was done in Paraguay in 1956 and 1957—for more than two consecutive years, or to reduce the amounts of rediscounts outstanding—as happened in Nicaragua in 1957—for more than one year. In principle, the required reduction of net increases in credit to banks and the private sector could have been achieved by either cost or quantitative restrictions.

As to cost restrictions, again in principle, there is no limit, i.e., at some high interest rate the demand for central bank credit will become highly elastic, and increases in the rate will therefore become effective in reducing demand. Neither country, however, permitted a rise in official interest rates to a level approaching the "natural" rate in the Wicksellian sense.

In Nicaragua, increases in the National Bank's discount rate, from 4 per cent to 5 per cent in 1953, and from 5 per cent to 6 per cent in 1954, reduced neither bank borrowing from the Issue Department nor the rate of credit expansion to the private sector. One reason probably was that the *effective* interest rates (including charges) charged by banks

ranged from 8 per cent to 17 per cent on mortgage loans and from 9 per cent to 10 per cent on commercial loans.

In Paraguay, interest rates ranged from 6 per cent to 10 per cent, according to the purpose of the loan. The central bank applied no cost restrictions because it was believed that an effective restriction of private credit would call for an unduly large rise in interest rates. On the contrary, it sometimes liberalized its rediscounting in order to reduce interest rates in private credit markets, as those rates were considered artificially high.

Sufficiently severe cost restrictions, possibly increases in official interest rates to a level approximating that prevailing in unofficial money markets, might have gone a long way toward restraining the demand for credit without interfering with the market mechanism. It is less certain to what extent the ensuing distribution of the "safe" amount of credit to the private sector would have coincided with, or deviated from, the one desired on the basis of social rather than private productivity criteria.

In view of the unwillingness to apply effective cost restrictions, ceilings on increases in total central bank credit to banks and the private sector would have been called for. As a rule, however, credit ceilings were imposed in a selective manner, with the major objective of controlling the *composition* of credit to the private sector rather than its *volume,* and with the view that private credit for "productive" purposes is not inflationary. Thus, the restrictive effects of ceilings on import, construction, and personal credits in Nicaragua were frequently offset by an expansion of loans for other purposes.

When a determined effort was made to reduce central bank credit to banks, as in Nicaragua and Paraguay in 1956–57, in combination with increases in, and enforcement of, legal reserve requirements, the rate of credit expansion to the private sector was effectively checked. The legal reserve policy succeeded in raising bank cash reserve ratios and in reducing the rate of secondary credit expansion in Paraguay; in Nicaragua it resulted in a substantial secondary credit contraction.

Again it would appear that, apart from legal limitations, which were gradually reduced in Nicaragua, the central banks in Nicaragua and Paraguay would have been able technically both to bring increases in their rediscounts closer in line with the required rate and to check the rate of secondary credit expansion. In the latter respect, abrupt increases in the credit multiplier, as in Nicaragua in 1954, provided a limitation.

In the absence of reductions in legal reserve requirements, the principal reasons for increases in the credit multiplier are reductions in the working reserve ratios of banks or a fall in the ratio of currency to

money. The latter ratio shows not insignificant changes from year to year in all countries during the period under review. Such changes are hardly subject to control by monetary authorities. Yet, there is no evidence of a continued decline in the currency/money ratio at a rate which would have made impossible any control of secondary credit expansion. The ability of banks to reduce their working reserve ratios, and thus to raise the credit multiplier, is subject to definite limitations. To be sure, when banks are liquid they may respond to a more stringent credit policy by reducing their reserve ratios.[14] When they are down to what they may regard as the minimum ratio, they cannot *raise* the credit multiplier further. At that stage, when central bank control over the credit operations of the banking system is greatly enhanced, central banks at times, as in Nicaragua in 1956, relax their quantitative restrictions, and thus forego the technically possible restrictions of credit to the private sector. Erratic changes in the credit multiplier, therefore, cannot explain *continued* technical inability to check secondary credit expansion.

Some Reasons for Insufficient Implementation of Restrictive Measures

From the foregoing analysis it follows that an effective application of rediscount policy and increases of reserve requirements could have succeeded in maintaining a fair degree of over-all monetary stability in Nicaragua and Paraguay; in Indonesia and Mexico, the rate of inflation could have been reduced. Accordingly, the question may be raised why the central banks did not adopt and carry out the necessary measures.

It has been shown that the potentially most effective single tool would have been greater restraint in central bank rediscounting activities on behalf of banks and related financial institutions. The failure to exercise a greater degree of restraint may have been due to the unwillingness of the monetary authorities. This unwillingness seems to be attributable primarily to their views on the purposes of, and the criteria for, monetary policy and to apprehension regarding the effects on output of a restrictive policy.

The monetary authorities in most, if not all, of the four countries

[14] To what extent banks will respond in this manner may depend partly on their expectations about the availability of central bank credit in the future. If they consider any tightening of central bank credit to be temporary, they will be more prone to respond by reducing their cash reserve ratios than if they expect a definite and lasting turn to more stringent rediscount policies.

were apparently guided predominantly in their activities with respect to the private sector by the needs of trade doctrine, safety of deposits, and soundness of individual loans (without being subject to the traditional built-in checks of the gold standard). They were not sufficiently concerned with control of the over-all volume of credit. This appears to hold the most in Indonesia and perhaps the least in Mexico. In view of the tendency to regard a central bank as an engine of growth rather than an instrument to enforce restraint, the traditional, as well as the Keynesian, doctrines appear to have been modified. The principal role of credit policy was deemed to consist in discouraging inflationary "unproductive" commercial credits and in encouraging supposedly noninflationary production credits for agriculture and certain "essential" industries in order to change the pattern of economic development. This reasoning appears to have prevailed in all the central banks concerned and explains the predominant reliance on selective credit controls.

There seems to be discernible, however, an increasing awareness of the limitations of this reasoning. This is indicated by the deliberate and at least initially successful attempts, notably in Paraguay and Nicaragua in 1956–57, to contract the volume of credit to the private sector or to reduce the rate of expansion substantially. The principal means employed to this end were restrictions on the availability of central bank credit to banks and the imposition or enforcement of legal reserve requirements.

However, not all aspects of concern with the output effects of a restrictive credit policy may be unjustified. Suppose that, in view of the anticipated rate of output, a cash deficit of the government prevents, for stability reasons, an expansion of an equal amount of credit to the private sector which otherwise would have been possible. If the increase in government expenditures (or the increase in private expenditures made possible by a fall in tax collections) is for current consumption, while an increase in credit to the private sector would have been used for investment, productive capacity and future output will grow at a lower rate. This decline in the rate of growth *may* be mitigated to the extent to which the unavailability of new credit for additional production induces additional saving and self-financing in the private sector. In other words, if additional credit had been available, it would have been used, say, to open up new areas for agricultural production. In view of its unavailability, however, the investments might yet be undertaken by a reduction in current consumption, i.e., an increase in current saving.

Suppose that the increase in government expenditures is devoted to public investment and that credit to the private sector is kept at the

same level as before. Instead of an increase in credit-financed private investment, there is a rise in credit-financed public investment. The effect on productive capacity and future output will depend on the relative productivity and gestation period of the investment undertaken and the investment foregone. If, for instance, the public investment is undertaken in fields with high capital/output ratios, e.g., in social overhead capital, while private investments are in fields with low capital/output ratios, such as an expansion in acreage, the growth in productive capacity and output in the immediate future will be reduced.[15]

Considerations of this kind may be particularly prominent in the minds of monetary authorities in less developed countries. An easy money policy may not result in any significant rise in prices as long as increases in the money supply are largely offset by substantial increases in production owing to a high level of investments, favorable crops, import surpluses, and a decline in velocity. In this setting of relative price stability, savings and investment habits may tend to change in the "right" direction. When total output falls, however, as a result, for example, of a crop failure, the monetary authorities face a dilemma which may be characteristic for predominantly agricultural countries, since Paraguay, Nicaragua, and perhaps also Indonesia, experienced situations of this kind.

A fall in output and employment in a predominantly industrialized economy is probably due to a deficiency in effective demand for goods and services, precluding large-scale capital destruction as a cause. Accordingly, an expansionary monetary policy may be called for. In countries where agriculture accounts for the largest part of the total product, a fall, or a substantial decline in the rate of increase, in aggregate output is probably due to a crop failure. Fewer goods will be available with a given money flow. Even without any monetary expansion, prices will tend to rise. If money is expanded, the rise in prices is likely to exceed the increase in money, as in Paraguay in 1952 and 1953 and in Nicaragua in 1955. A stabilizing monetary policy would call for a net contraction of credit to banks and the private sector. However, the fall in agricultural incomes will, to some extent, lead to defaults on agricultural loans and inability to collect. The larger the share of agricultural loans in total private credit outstanding, the greater will be the difficulty of contracting credit. The less it is possible to contract, the greater will be the rise in prices on account of any given fall in output (unless foreign exchange resources permit increased imports).

[15] The opposite may, of course, also be the case, when, for instance, private investments take largely forms such as residential construction, which hardly increase productive capacity.

Suppose that at least an expansion of credit is prevented. Agricultural producers will have to do without working capital for the next season's planting. The more they rely on credit for their working capital needs—in Paraguay the ratio has been estimated at close to 100 per cent—the smaller is likely to be the area planted and the smaller will output and income be during the following period. If, however, new credit is granted, money during the current period is increased while currently fewer goods and services are available. To the extent to which the restrictive credit policy deprives manufacturing industries of working capital, underutilized capacity will emerge in those sectors too.

As there are indications, e.g., in Nicaragua, that agricultural producers tend to use their own resources for investments in real estate and commercial undertakings, a reduction in production loans may result in some redirection of producers' own resources to the self-financing of their output rather than in a reduction in output. It is a problem for the monetary authorities under such conditions to determine to what extent a reduction of credit to producers would result in increased self-financing and to what extent in a reduction in output. If producers have become accustomed to rely on bank credit for their working capital, an abrupt restriction of credit would probably not result in immediate changes in deeply ingrained savings and investment habits. Slow changes could perhaps be expected if credit gradually is made scarcer and dearer.

As noted earlier, the monetary authorities in Mexico felt compelled to relax credit restrictions in 1952 because of a fall in output and employment in all sectors except agriculture, which followed a decline in private investment and reductions in public investment. The resulting fall in effective demand, reinforced by a decline in the share of wages and salaries in national income, led to underutilization of productive capacity in some consumer goods industries.

The views and attitudes of the monetary authorities may be seen in perspective, if they are related to the legal and institutional framework within which they operate. In Nicaragua, for instance, a law had been enacted during the depression which assured agricultural producers almost unlimited credit for production and marketing, subject only to certain minimum collateral requirements. Also, it committed banks to renew production loans practically on request. In this setting, the Issue Department of the National Bank apparently had become accustomed to extending rediscounting facilities to the Banking Department in a more or less automatic fashion. Also, the power of the Issue Department over the Banking Department was largely nominal because the managers of both departments were on the same ad-

ministrative level and under the same superior. The Banking Department is the principal commercial bank, accounting for about 80 per cent of total loans and deposits. Accordingly, the effects of monetary measures could at best be marginal, unless they could be enforced also with respect to the Banking Department, as was done to some extent in 1957; by then, however, the growth of the three private banks had increased the practical importance of measures directed toward them.

Similarly, the Bank of Paraguay continued to provide about 80 per cent of total credit to the private sector after its Issue Department had been converted into a separate modern central bank. Not only did the Bank of Paraguay extend medium-term and long-term credit to agriculture and industry, but it also engaged in the purchase and distribution of seeds, fertilizers, and crops. Since it holds only about 40 per cent of private demand deposits, it derives most of its resources from the central bank. The three other commercial banks in the country are all branches of foreign banks. Here, too, effective restraint in rediscount activities hinged on enforcement of restrictions upon the quasi-monopoly government bank. It may take some time to impose upon state banks, which are perhaps more influential, the degree of control that is necessary.

Another, more subtle, restraining factor that explains the unwillingness of a central bank to exercise the restraint technically possible and feasible may be its standing in the community. Central banks cannot refuse credit to the government[16] while, in principle, they can refuse it to the private sector. In practice, however, it will often be difficult to exercise this power. When the private sector's demand for credit rises, as is likely under inflationary conditions, a denial of accommodation will antagonize the public, including banks, against the monetary authorities. Criticisms will, of course, be aired in terms of observations that the authorities stifle economic progress by preventing "productive" investments, or that restrictions will hurt mostly national but not foreign banks and businesses. Central banks, especially when they are new and have little tradition and prestige to start out with, may feel, perhaps not without justification, that continued criticism along these lines will jeopardize their limited status in the community still

[16] To quote Mr. Montagu Norman: "I look upon the Bank [of England] as having the unique right to offer advice and to press such advice even to the point of nagging: but always of course subject to the supreme authority of the Government!" Cited by Sir Theodore Gregory in *The Present Position of Central Banks* (The Stamp Memorial Lecture delivered before the University of London on October 31, 1955, University of London, The Athlone Press, 1955), p. 10.

further and may ultimately eliminate whatever admittedly little influence and effective power they have.[17]

Some Conditions for Greater Efficacy of Monetary Policy

These observations suggest some avenues toward improving the efficacy of central banking in less developed countries. The experiences of the four countries reviewed suggest that governments are perhaps not as universally the principal single source of inflation as often seems to be supposed. Nor is the actual, and much less the potential, scope for an anti-inflationary monetary policy quite so limited as is frequently concluded. The more significant is central bank credit to the private sector as a primary expansion factor, the greater will be the possibility of preventing chronic inflation through monetary measures. It follows that the realization of a stabilizing, or, if the government is the primary expansion source, an at least partially compensating policy, requires the removal of obstacles. The most important obstacle seems to be the unwillingness of the monetary authorities to exercise greater restraint upon the private sector. Limitations to the control of secondary credit expansion and contraction seem to be less important. Such limitations appear in the structure of money and capital markets and in the payments habits and asset preferences of the public. The perhaps least significant and relatively easiest removable obstacles may be found in banking legislation.

If monetary authorities are reluctant to exercise a greater measure of restraint in their credit policy because they believe that a highly elastic supply of credit is conducive to an acceleration of economic development, the lessons of experience may gradually tend to induce changes in views.

So far as unwillingness to enforce sufficiently severe anti-inflationary measures is due to apprehensions regarding the short-run output effects of a restrictive credit policy, it may be more difficult to induce a greater degree of restraint. For a less developed country in which the foremost policy objective is not only absolute but also relative economic growth, underutilized productive capacity will be socially less tolerable than in an advanced industrial economy where the stability of full employment objectives tend to take priority over the growth objective. It may, therefore, be difficult to persuade monetary authorities to contract

[17] When perusing annual reports of central banks in underdeveloped countries, one is always struck by the frequently recurring statements that great pains were taken to satisfy the public's demand for credit for "legitimate" purposes.

credit, or even to freeze it, when, for instance, output and income in the agricultural sector fall on account of exogenous factors, like a crop failure or depressed export markets, since such a policy may result in underutilized capacity. Similar considerations may hold in regard to credit restrictions for import-competing industries when income falls or imports increase. If, however, producers, especially in the agricultural sector, derive their working capital and, for that matter, long-term finance not from the monetary system but largely from their own resources and nonbank financial intermediaries (with nonmonetary liabilities), there will be less reliance on medium-term and long-term credit from the monetary system and monetary policy can become more flexible; that is, of course, provided that the nonbank financial intermediaries do not obtain their resources primarily from the central bank.

In their day-to-day decisions on credit policy, especially in respect to rediscounting, central banks are likely to be more concerned with the immediate effects of their decisions on output than with the long-run effects on propensities (to save, to invest, to hold money, securities, or real assets) and the structure of the financial system. In less developed countries, those long-run effects will, however, determine the scope for monetary policy in the future. Therefore, an important, although perhaps unorthodox, field of what may be called long-run monetary policy may lie in activities that aim at changing these propensities and the structure of the monetary and financial system. Such attempts may often conflict with short-run policies; for instance, open market sales of securities may clash with the endeavor to prevent fluctuations in security prices in order to induce the public to invest in securities and to create conditions for using open market operations as a stabilizing instrument in the future. Other related measures are the encouragement of specialized savings institutions and the extension of central bank control over the investment policies of nonbank financial intermediaries.[18] If such long-run policies succeed in changing

[18] It is customary to discuss such efforts in terms of mobilization and channeling of idle savings. This manner of formulating the problem tends to perpetuate the frequent confusion between *saving* as a flow and *savings* as a stock. It creates the impression that there is no deficiency in the flow of saving and that the only problem is to get hold of the stock of idle savings and to direct it into productive investments. In fact, this stock of savings, in the form of currency hoards or savings and time deposits, has already been invested during the income period in which it was accumulated; that is, during those past income periods the deflationary effect of nonspending was offset by the inflationary effect of credit-financed spending. If those idle savings were literally mobilized and spent, the inflationary effect would be the same as a corresponding increase in expenditures financed with newly created money. It might be less ambiguous to formulate the problem in terms of increasing the flow of saving and of reducing the liquidity of the asset portfolio of the public. Monetary policy may not be able to accomplish much in regard to the flow of saving except perhaps by raising interest rates. The relationship between

saving, investment, and asset-holding habits in the "right" direction, some reasons for the reluctance of central banks to apply restrictive measures to commercial banks and the private sector will gradually disappear.

Complementary measures of long-run monetary policy might aim at widening the banking system. The establishment of new banks under the—so to speak—sponsorship of central banks would, in suitable circumstances, tend to strengthen the prestige and power of moral suasion of the latter. Moreover, as the new banks are less likely than old banks to hold substantial excess reserves, or to have access to foreign funds, their lending policies will be more responsive to central bank rediscount policies.

One particular aspect of long-run monetary policy may warrant special attention. The extent to which credit can be expanded without inflation, other things being equal, will be greater when income velocity declines than when it remains constant or even increases. Long-run policy may, therefore, aim at reducing velocity by, say, lengthening payment periods and encouraging the holding of money. On the other hand, it has also been noted that the efficacy of short-run monetary policy will be raised when the public, including banks, can be induced to hold financial assets and to use means of payment less liquid than money. However, if this objective is pursued, velocity will tend to increase, other things being equal. This will reduce the scope for credit expansion without inflation; but it will also permit greater credit extension by financial institutions outside the monetary system, i.e., from sources other than the central bank and commercial banks.

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saving and interest rates is, however, uncertain. The measures discussed above in terms of long-run monetary policy all aim at reducing the liquidity of the public, in respect both to the use of means of payment and to asset holding.

The Relation Between Inflation and Economic Development

A Statistical Inductive Study

U Tun Wai *

THE RELATION BETWEEN INFLATION and economic growth in less developed countries is a subject on which there are still very wide differences of opinion. This paper describes an attempt to resolve these differences by an appeal to statistics. Do the relevant statistics provide an answer to the question whether different rates of development tend to be systematically associated with different rates of inflation? When the enquiry was started, it was recognized that the less developed countries are extremely heterogeneous, and that the operation of factors other than inflation (of which the study takes no account) might have more significant effects than the influence of inflation upon the rate of development. For these reasons, it was realized the study might not be found to reveal any clear relation, either positive or negative, between inflation and growth. Moreover, the limited amount of statistical data available, relating for the most part to only the postwar period, and shortcomings in the coverage and consistency of these data were likely to diminish the weight to be attached to any findings that might emerge from the study.

For the less developed countries in general, the findings did indeed prove to be inconclusive; but for most of the small number of individual countries for which the available statistics cover periods in which the rates of price increase differ significantly, the evidence suggests that the rate of growth was higher when the rate of inflation was lower.

Despite these inconclusive results, which at present are all that the statistical techniques used in this study have been able to produce, many of the details are of considerable interest. An examination of the tables and charts which show how these techniques have been applied to the material now available may indicate how they might be used more effectively at some later date when material which is more adequate and covers a longer period may be available.

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Statistical Concepts

In this study, the rate of inflation is measured primarily by reference to the cost of living index. Indices of the weighted average of national income or national product sector prices are also used in a context described below. The weighted average of sector prices is an implicit index derived from the ratio of national income (or of some other measure of social product) at current prices to national income (or social product) at constant prices.

The rate of economic growth is measured first by reference to changes in national income, or in some other aggregate of the social product, expressed in constant prices, with or without adjustments for population growth and for changes in the terms of international trade. Four measures of growth are thus available, the figures in each case being deflated by reference to the cost of living index: (1) national income, (2) national income per capita, (3) national income adjusted for changes in the terms of trade, and (4) national income per capita adjusted for changes in the terms of trade. The first two of these measures are listed for 31 countries in Table 1 and the last two for 13 countries in Table 2.

TABLE 1. INFLATION (MEASURED BY RATE OF INCREASE IN COST OF LIVING) AND ECONOMIC DEVELOPMENT[1]

(In per cent per annum, compounded)

Country	Period	Rate of Inflation	Rate of Growth	Rate of Growth Per Capita	Number of Observations	Coefficient of Correlation of Least Squares Fit for Rate of Growth (r)
Argentina	1938–44	2.7	5.9	2.7	7	.891
	1944–48	16.6	12.7	10.3	5	.932
	1948–52	36.6	− 7.1	− 9.1	5	− .937
	1952–54	4.2	7.9	5.6	3	1.000
Brazil	1947–50	3.8	9.9	7.3	4	.965
	1950–53	16.6	1.0	− 0.7	4	.391[2]
British Guiana	1948–51	6.9	3.9	1.4	4	.860[2]
Burma	1950–53	− 3.1	17.9	16.7	4	.998
Ceylon	1947–51	1.5	12.2	8.6	5	.983
	1951–54	0.2	2.2	− 0.5	4	.433[2]
Chile	1942–46	12.3	7.9	6.1	5	.990
	1946–52	22.1	2.3	0.6	7	.794
Colombia	1945–51	13.7	4.5	2.7	7	.965
	1951–54	4.9	7.9	5.8	4	.992
Cuba	1937–47	14.2	1.6	0.1	11	.421[2]
	1947–54	− 0.3	1.8	0.1	8	.615[2]
Dominican Republic[3]	1950–54	1.0	6.6	3.9	5	.956
Ecuador	1950–54	4.1	5.1	2.0	5	.925
Egypt	1950–53	0.02	− 1.0	− 4.6	4	− .500[2]

TABLE 1 (*concluded*). INFLATION (MEASURED BY RATE OF INCREASE IN COST OF LIVING) AND ECONOMIC DEVELOPMENT[1]

(*In per cent per annum, compounded*)

Country	Period	Rate of Inflation	Rate of Growth	Rate of Growth Per Capita	Number of Observations	Coefficient of Correlation of Least Squares Fit for Rate of Growth (r)
Guatemala[3]	1946–54	4.0	5.3	2.3	9	.885
Honduras	1938–46	7.2	2.0	0.3	9	.766
	1946–52	6.0	4.6	1.9	7	.975
India	1948–53	1.3	2.9	1.2	6	.949
Israel	1950–54	29.3	12.1	4.9	5	.913
Japan	1948–51	10.1	19.1	17.2	4	.972
	1951–54	5.9	4.5	2.9	4	.869[2]
Kenya[4]	1947–54	6.4	6.0	4.3	8	.914
Lebanon	1948–54	−2.0	6.5	3.9	7	.946
Malaya[3]	1949–51	18.0	21.0	18.2	3	.998
	1951–53	−0.4	−9.0	−12.0	3	.973[2]
Mexico	1939–47	19.6	5.4	2.5	9	.963
	1947–54	7.5	5.1	2.3	8	.942
Pakistan	1950–53	5.3	−1.2	−3.2	4	−.635[2]
Panama	1948–52	−0.8	5.2	2.2	5	.955
Paraguay	1950–54	84.1	7.8	5.4	5	.762[2]
Peru[5]	1943–48	22.7	3.0	1.0	6	.894
	1948–53	10.2	8.0	6.3	6	.943
Philippines	1947–54	−1.2	6.0	3.9	8	.988
Puerto Rico	1942–47	5.7	1.8	0.3	6	.389[2]
	1947–50	−4.1	11.1	10.5	4	.974
	1950–53	6.2	2.0	2.0	4	.951
Rhodesia, Northern	1946–53	4.7	26.2	23.3	8	.969
Rhodesia, Southern	1939–44	1.6	8.7	−9.5	6	.528[2]
	1944–47	2.6	10.3	7.2	4	.996
	1947–53	6.8	8.5	4.8	7	.979
Thailand[4]	1947–50	−1.3	18.6	11.7	4	.995
	1950–53	12.6	−1.0	−1.4	4	−.513[2]
Turkey	1948–54	2.6	8.5	6.2	7	.862
Venezuela	1949–53	1.3	7.1	3.7	5	.730[2]

[1] Inflation measured by the rate of increase in the cost of living index; economic growth measured by the rate of increase in the national income, deflated by the cost of living index.

National income was adjusted for population growth by deflating the national income in constant prices by the population indices. The least squares method was used to find the lower and upper value of each period, the period being determined by the slope of the cost of living index. These values were then used to determine the annual rate of growth (compound) adjusted by population changes.

The base for all calculations is 1948 = 100 with the following exceptions: 1949 = 100 for Venezuela, 1950 = 100 for Argentina, the Dominican Republic, Israel, Pakistan, and Paraguay, and 1953 = 100 for Burma, Guatemala, and Turkey.

The series shown here have been calculated from data in the following publications: International Monetary Fund, *International Financial Statistics;* United Nations, *Statistics of National Income and Expenditure* (Statistical Papers, Series H), *Monthly Bulletin of Statistics, Statistical Yearbook, Yearbook of International Trade Statistics, Economic Survey of Latin America, Economic Survey of Asia and the Far East, Economic Developments in the Middle East, 1954–55,* and *Economic Developments in Africa;* Central Statistical and Economics Department of Burma, *Quarterly Bulletin of Statistics;* Central Bank of Ceylon, *Bulletin.*

[2] The coefficient of correlation is not significant at the 5 per cent level.

[3] Gross national product.

[4] Net domestic product.

[5] Real national income in 1934–36 prices with base period changed to 1948.

TABLE 2. INFLATION (MEASURED BY RATE OF INCREASE IN COST OF LIVING) AND ECONOMIC DEVELOPMENT[1]

(In per cent per annum, compounded)

Country	Period	Rate of Inflation	Rate of Growth	Rate of Growth Per Capita	Number of Observations	Coefficient of Correlation of Least Squares Fit for Rate of Growth (r)
Brazil	1947–50	3.8	7.2	4.9	4	.958
	1950–53	16.6	1.8	− 0.5	4	.440[2]
Colombia	1948–51	13.7	1.6	− 0.3	4	.492[2]
	1951–54	4.9	5.7	3.5	4	.950
Dominican Republic[3]	1950–54	1.0	8.5	5.6	5	.932
India	1948–53	1.3	2.5	0.8	6	.973
Israel	1950–54	29.3	12.4	5.4	5	.922
Japan	1948–51	10.1	18.9	17.0	4	.968
	1951–54	5.9	4.1	2.5	4	.860[2]
Mexico	1950–54	7.0	3.2	0.4	5	.900
Pakistan	1950–53	5.3	− 1.5	− 3.3	4	− .593[2]
Panama	1948–52	− 0.8	5.0	2.2	5	.943
Philippines	1947–54	− 1.2	6.3	4.3	8	.989
Rhodesia, Southern	1947–53	6.8	6.9	3.5	7	.984
Turkey	1948–54	2.6	8.4	5.7	7	.849
Venezuela	1949–53	1.3	6.2	2.9	5	.659[2]

[1] Inflation measured by the rate of increase in the cost of living index; economic growth measured by the rate of increase in the national income, deflated by the cost of living index and adjusted for changes in the terms of trade.

The effects of changes in the terms of trade on real national income were computed on the basis of the formula given in the Appendix, page 316. The gain or loss so obtained for each year (in units of currency at constant prices) was either subtracted from or added to the real national income and per capita real national income. The least squares method and the usual compound-amount formula were then used to compute the rate of growth (for both total and per capita), adjusted for changes in the terms of trade.

For statement of sources used, see Table 1, footnote 1.

[2] The coefficient of correlation is not significant at the 5 per cent level.

[3] Gross national product.

In some countries, the rate of economic growth can also be estimated by measuring the social product at constant sector prices. This gives two additional measures of growth, one with, and the other without, adjustment for population growth. These are presented for 11 countries in Table 3. In these cases, the rate of inflation is suitably measured by reference to the index of the weighted average of sector prices as defined above.

Times series of the measurements of growth, of the cost of living index, and of the weighted average of sector prices were plotted on ratio charts for each of the countries for which the relevant data are available. Periods, which are listed in Tables 1, 2, and 3, were also demarcated for as many countries as possible in which differences in the

TABLE 3. INFLATION (MEASURED BY RATE OF INCREASE IN SECTOR PRICES) AND ECONOMIC DEVELOPMENT[1]

(In per cent per annum, compounded)

Country	Period	Rate of Inflation	Rate of Growth	Rate of Growth Per Capita	Number of Observations	Coefficient of Correlation of Least Squares Fit for Rate of Growth (r)
Argentina[2]	1938–44	4.8	3.9	1.7	7	.930
	1944–48	21.2	8.9	7.1	5	.942
	1948–52	26.7	−2.0	−4.1	5	.783[3]
	1952–54	7.0	5.1	2.0	3	1.000
Brazil[4]	1947–50	4.9	8.8	6.6	4	.989
	1950–53	12.0	5.2	2.3	4	1.000
Burma[5]	1950–53	4.3	9.1	7.8	4	.992
Ceylon[6]	1947–51	7.4	7.8	4.9	5	.996
	1951–54	−0.8	2.1	0.7	4	.792[3]
Chile[7]	1942–46	11.6	8.1	6.3	5	.994
	1946–52	21.7	2.7	1.3	7	.842
Guatemala[8]	1946–54	5.3	4.6	1.6	9	.844
Honduras[9]	1938–46	5.5	5.6	1.5	9	.939
	1946–52	3.7	6.2	3.3	7	.992
India[10]	1948–53	1.1	2.9	1.3	6	.948
Japan[11]	1948–51	13.5	15.7	13.2	4	1.000
	1951–54	3.0	7.5	6.4	4	.977
Mexico[12]	1947–50	5.3	6.1	3.3	4	.977
Turkey[13]	1948–54	3.9	7.2	4.4	7	.882

[1] Inflation measured by the rate of increase in the index of the weighted average of sector prices; economic growth measured by the rate of increase in social product (as indicated below), deflated by the sector price index and adjusted for changes in the terms of trade.

The methods of computing the data on social product used in this table automatically eliminated the effects of changes in the terms of trade; see Appendix.

For statement of sources used, see Table 1, footnote 1.

[2] Gross national income at constant prices, derived from gross domestic product obtained from the indices of agricultural and industrial production and by deflating other sectors by appropriate price indices.

[3] The coefficient of correlation is not significant at the 5 per cent level.

[4] Real national income based on index of agricultural and industrial production and of output of services in 1939 prices. The base period was changed to 1948.

[5] Gross domestic product based mainly on index of volume of production.

[6] Real geographic product (equal to the national income at constant prices less adjustment for changes in the terms of trade less income from abroad).

[7] Net national product at 1940 factor cost, obtained by deflating components of net product by industries and by appropriate price indices. It is apparently adjusted for changes in the terms of trade.

[8] Gross national product in 1946 prices. Components of expenditure on gross national product at market prices were separately deflated by price indices.

[9] Gross national product in 1948 prices. Apparently adjusted for changes in the terms of trade.

[10] Net domestic product in 1948–49 prices. Apparently adjusted for changes in the terms of trade.

[11] National income in 1934–36 prices. (The aggregate national income was deflated by a weighted index of prices obtained by combining separate indices for rural and urban consumer goods and producer goods.)

[12] Net domestic product in 1939 prices. The volume indices for 13 separate industrial groups were combined by weights proportionate to each industry's contribution to the net domestic product at factor cost in 1949.

[13] Net national product in 1948 prices. Components of the net national product at factor cost by industries were separately deflated by price indices.

rate of inflation were readily recognizable. The periods were distinguished primarily on this basis because, for the purposes of this study, prices are considered to be the independent variable. In some instances, where there was no change over many years in the rate of price increase but a marked change in the slope of the curve for the social product, periods were differentiated by reference to the change in the slope of this curve.

For each period, straight lines were then fitted to the observations by the least squares method, and values were computed from the equations for prices and output for the first and last years of the period. From these computed values, rates of inflation and of growth (per cent per annum compounded) were calculated by the formula $(1+r)^n=\frac{S}{A}$, where A is the computed value for the first year of the period, S the computed value for the last year, n the number of years in the period,[1] and r the rate of inflation (for the price index) or of growth (for output) per annum.

In order to standardize the material used in this study, it was considered advisable to apply a statistical test to determine whether the rates of growth indicated by the method described above were representative of the experience of the periods. This was done by correlating growth and time for each of the periods;[2] periods for which the coefficient of correlation was not significant at the 5 per cent level were eliminated (see Tables 1, 2, and 3). The remaining observations of growth which were statistically significant were plotted with their corresponding rates of inflation on scatter diagrams. The few observations with negative rates of inflation were not plotted because the study is concerned with inflation and not deflation.

In Chart 1, the rate of increase in the cost of living index is plotted on the Y axis and that of national income and of national income per capita, both at constant prices, is plotted on the X axis. Each dot in the chart represents a period of significant observation for one of the countries presented in Table 1. Countries with more than one period of significant observation are represented by more than one dot. Charts 2 and 3 have been similarly plotted from the significant material in Tables 2 and 3.

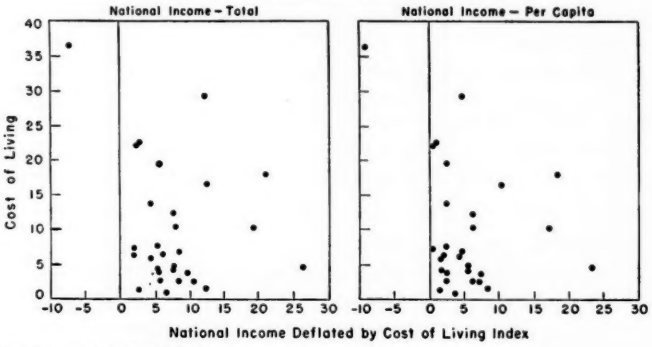
The scatter in Charts 1 and 2 is so wide that no straight line or curve can be fitted to establish any relationship between inflation and growth. In Chart 3, a curve can be fitted to each scatter diagram, but the

[1] The number of years in a period is one less than the number of observations.

[2] It was not necessary to correlate the rate of price increase with time, because the periods had been chosen by grouping together years in which there was practically no change in the rate of inflation.

CHART 1. RATE OF INCREASE IN COST OF LIVING INDEX AND IN NATIONAL INCOME AT CONSTANT PRICES[1]

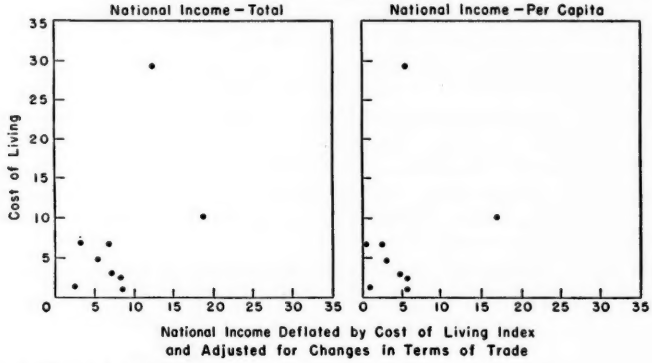
(In per cent per annum, compounded)



[1] Based on data in Table 1.

CHART 2. RATE OF INCREASE IN COST OF LIVING INDEX AND IN NATIONAL INCOME AT CONSTANT PRICES ADJUSTED FOR CHANGES IN TERMS OF TRADE[1]

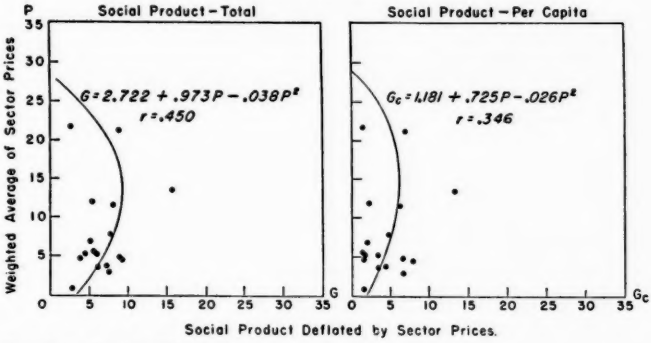
(In per cent per annum, compounded)



[1] Based on data in Table 2.

CHART 3. RATE OF INCREASE IN WEIGHTED AVERAGE OF SECTOR PRICES AND IN SOCIAL PRODUCT AT CONSTANT SECTOR PRICES[1]

(In per cent per annum, compounded)


Social Product – Total
Social Product – Per Capita
Weighted Average of Sector Prices
P
G
Gc
G = 2.722 + .973P – .038P²
r = .450
Gc = 1.181 + .725P – .026P²
r = .346
0 5 10 15 20 25 30 35
Social Product Deflated by Sector Prices.

[1] Based on data in Table 3.

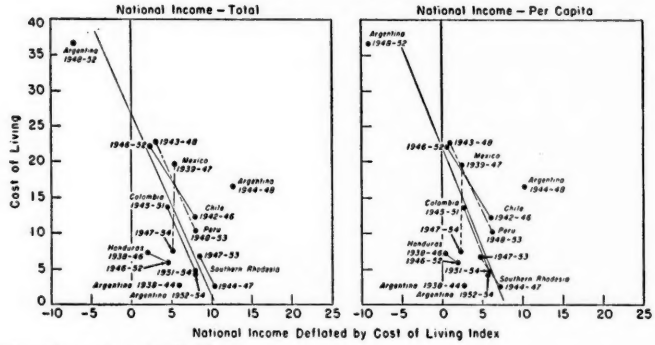
coefficients of correlation are very low and not significant at the 5 per cent level.[3] Therefore, for the less developed countries as a group, the evidence analyzed in this study does not warrant any conclusion regarding the relationship between inflation and economic development.

The concluding stage in the study, undertaken in order to ascertain whether an analysis of intracountry comparisons over time might yield more satisfactory results than the comparisons presented in Charts 1, 2, and 3 between a number of very heterogeneous countries, was limited by the fact that prewar data are available for only a few countries, and that for most countries the postwar experience has not been broad enough so far to permit the identification of more than one significant period. By plotting the data available for those countries where more than one period of significant observation can be distinguished, an attempt at intracountry comparison was made, the results of which are presented in Charts 4 and 5. Where there were only two significant periods, as was usually the case, the two dots which represent the observations were joined by a straight line. Where there were more than two observations, as in Argentina, a least squares fit was determined. According to Chart 4, all the countries surveyed except Mexico had more development in the period of less inflation than in the period

[3] Since the coefficient of correlation is not significant, no inferences are warranted from the fact that the curves in Chart 3 are downward sloping over one part and upward sloping over another part of their range, nor can any significance be attached to the point of inflection.

CHART 4. RATE OF INCREASE IN COST OF LIVING INDEX AND IN NATIONAL INCOME AT CONSTANT PRICES, SELECTED COUNTRIES[1]

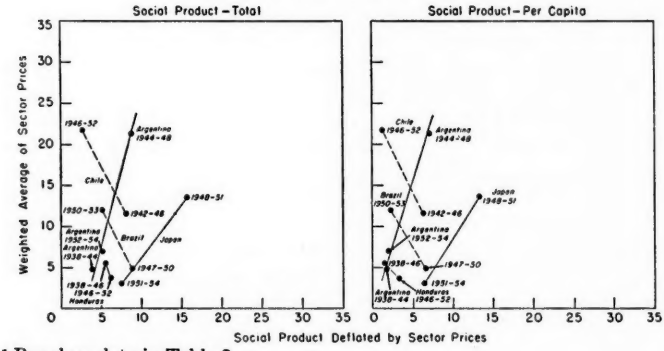
(In per cent per annum, compounded)



[1] Based on data in Table 1.

CHART 5. RATE OF INCREASE IN WEIGHTED AVERAGE OF SECTOR PRICES AND IN SOCIAL PRODUCT AT CONSTANT SECTOR PRICES, SELECTED COUNTRIES[1]

(In per cent per annum, compounded)



[1] Based on data in Table 3.

of greater inflation. In Mexico, the rate of growth remained practically unchanged with different rates of inflation. Chart 5 indicates that Brazil, Chile, and Honduras had more growth in a period of less inflation than in a period of greater inflation, while the opposite was true for Argentina and Japan.

APPENDIX

Conceptual and Methodological Problems

Both the measurement of inflation and the measurement of economic growth raise certain conceptual problems that need to be examined.

Measurement of inflation

For the purposes of this study, it was considered simplest and most appropriate to adopt the working hypothesis that there is inflation when prices are increasing fairly rapidly. In any given situation, the rate of price increase may be much slower than is warranted by the basic inflationary conditions because inflation may be suppressed through price control or rationing. In this paper, however, the effects of this limitation are not serious, since the majority of the less developed countries are unable to keep inflation suppressed for any length of time.

Types of inflation

In the long run, an inflation created by an expansion in investment demand will be less serious than one resulting from an expansion in effective demand for consumer goods. Additional investment enables output to expand more rapidly than before, while additional consumption usually does not. It was not considered feasible, however, to attempt in the present study to distinguish between these two types of inflation. In any case, their effects in either the short term or medium term are not likely to be widely different.

Selection of a price index

What price index should be used as an indicator of inflation and as a deflator for money national income? The cost of living index is available for most countries, but its use as an indicator of inflation may be misleading because of the large part usually played by export and import goods in its construction. Situations may arise in which there is no domestic inflation—that is, no increase in the prices of goods and services produced and consumed domestically—but nevertheless the cost of living index rises, because of a world-wide inflation and increases in the prices of export and import goods. The same problem arises if the wholesale price index is used as an indicator of inflation, and it may be argued that the most appropriate indicator is an index of prices of goods and services produced and consumed domestically.

In practice, however, it is not feasible to rely exclusively on an index of this kind, which indeed for the less developed countries is not generally available. Furthermore, for the purposes of the present study, some arguments can be advanced in favor of the use of a broader index. One of the major objectives of a measurement of inflation is to determine the probable effects of price increases on incentives to save and invest (especially in "productive fields"). Changes in the cost of living index, which measure the prices of goods and services to final consumers, should determine somewhat the saving habits of the people. From this point of view, the inclusion of export and import goods in the cost of living index is not undesirable because, to the extent that these goods are consumed domestically, their prices also affect incentives to save. Changes in the cost of living index, of course, do not necessarily influence the decisions of investors.

Similarly, a wholesale price index of domestically produced and consumed goods is open to the objection that it neglects an important element of price formation in countries where foreign trade is important. Prices of export and import goods, and especially of capital goods, have a bearing on decisions to invest and to expand output in both the export sector and the purely domestic sector of the economy, and therefore have a good claim to be taken into account.

The conclusion is that no single index can be regarded as completely satisfactory for the purposes of this study. For countries where the rate of inflation has been high, as in Chile, it does not matter which index is used, since all prices tend to increase at about the same rate. For countries where price increases have been smaller, a composite index derived from the ratio of gross domestic product at current prices to gross domestic product at constant sector prices may be used. However, such statistics are available for only a few of the less developed countries.

Measurement of economic development

Economic development may be broadly described as an improvement in the general standard of living, and may be measured by changes in the amount of available goods and services, as indicated, for example, by changes in the national income at constant prices. It might be misleading, however, merely to compare the rate of inflation with the growth in real national income or even with per capita income,[4] because many factors other than inflation (some of which are discussed below) have an effect upon economic growth.

[4] The comparative advantages of these two measures of growth are examined in greater detail below.

Available resources and unused capacity

The rate of economic development is influenced by the availability of natural resources, such as mineral deposits, fertile land, and rainfall, and of human resources, such as the size, energy, and skills of the working population. Differences between countries' endowments of such natural and human resources no doubt help account for differences between their rates of economic growth. Differences in resources are not taken into account in the present study, but this omission does not seriously affect its usefulness. The study does not attempt to explain fully the differences between national rates of growth but only to explore the relation between growth and inflation. Even in the best endowed countries, considerable investment is likely to be required to make more intensive use of available resources, and such investment may either give rise to inflationary pressures or be influenced by the existence of inflation. Although a few of the less developed countries may in some of the years studied have had unused social overhead capacity in the form of transport, power, etc., this does not seem to have been at all common.

Domestic product versus national product (national income) and foreign investment

The choice between domestic product and national income as an indicator of economic growth is not of practical importance since in most cases the two change at about the same rate. There are, however, some significant theoretical differences between the two measures. The difference between domestic product and national product is equal to the "net factor income payments from abroad," which is the combined result of factor income receipts from abroad and factor income payments abroad. Most of the less developed countries have scarcely any factor income receipts from abroad, but have to make significant factor income payments abroad; in these countries, national product is, therefore, smaller than domestic product.

The choice between domestic product and national product may seem to depend on the treatment that is desired for the effects of foreign investment on domestic output. In a study of the effects of inflation on growth, it seems at first sight reasonable to prefer domestic product as the basis for measurement, for the effects of foreign investment on domestic output will then also be covered. For example, if deficit-financed government expenditures lead to serious inflation, foreign investment is likely to be discouraged so that the output attributable to foreign investment will be less than it would otherwise have been.

Under such conditions, it might seem that this decline should be taken into account in appraising the effects of inflation. On the other hand, if foreign investment decreases, the factor income payments abroad will decline after some time, and national product (national income) will also be smaller. Therefore, it will make little difference which of the two is used as an indicator of growth. Since national income data are available for nearly all countries, while statistics on domestic product are not easily obtained, national income deflated has been used in this study as an indicator of growth.

Total output versus per capita output

The choice between total output and per capita output as a measure of economic growth depends upon several considerations. Per capita output may be preferred because changes in total output may be merely a reflection of changes in the size of the working population. This point is of great importance because the rates of population increase in less developed countries are not the same. Per capita output may also be regarded as a better indicator than total output of the capacity of the economy to save and invest.

On the other hand, the choice of per capita output may be misleading if there is a large amount of disguised unemployment. In these circumstances, an increase in population may merely increase the extent of disguised unemployment without raising the level of output. For these reasons, both measurements have been used in this study.

Adjustment for terms of trade

The case for making some adjustment for the effect of changes in terms of trade may be illustrated by a simple example. Assume that an economy produces only one commodity, part of which it exchanges for another commodity in international trade. Assume also that it usually produces 100 bananas, of which it consumes 90 and exchanges 10 for 15 oranges. If in a subsequent period its output of bananas remains unchanged but the price ratio in international trade of bananas and oranges changes in its favor so that 10 bananas will now be exchanged for 20 oranges, its national income will have risen from 90 bananas plus 15 oranges to 90 bananas plus 20 oranges, despite the fact that the output of bananas remains unchanged. The increase in national income is purely the result of the increase in income from an improvement in the terms of trade.

To determine whether adjustments need be made for the terms of trade, the method of compilation of the social product and the price

deflators used to reduce it to real terms have to be examined. Of the three methods of computing national income, the output, the income, and the expenditure methods, the first two may be treated together and the third separately. In the UN publication, *Statistics of National Income and Expenditure* (Statistical Papers, Series H, No. 9), the relevant tables for the three methods are those headed "Industrial Origin of Net Domestic Product," "Distribution of the National Income," and "Expenditure on Gross Domestic Product." Statistics of the distribution of national income by sectors, i.e., wages, rent, interest, dividends, etc., at constant prices are not available.

If each sector shown in the table, "Industrial Origin of Net Domestic Product," is deflated by its appropriate sector price level, then the total net domestic product will be an accurate indicator of economic growth, though this might exclude any increase or decrease in real income resulting from changes in the terms of trade, especially if the country imports only or mainly consumer goods. If, however, a large proportion of imports consists of raw materials or capital goods, then a part of the increase (or decrease) in net domestic product (at constant sector prices) may be due to the greater (or smaller) quantity of raw materials and capital goods which have been bought for a given quantity of exports. Insofar as the imports of most of the less developed countries consist mainly of consumer goods, the net domestic product compiled by the output method and deflated by sector prices may be considered a good approximation of economic growth net of the effects of the terms of trade.

If the domestic product is compiled by the expenditure method and each sector is deflated by its own sector price, then there is no need to adjust for the terms of trade. This follows from the fact that the expenditure on gross domestic product is equal to consumption expenditure (private and government) plus gross fixed capital formation (private and government) plus increases in stocks, plus exports of goods and services less imports of goods and services. Thus, if exports and imports are deflated by their appropriate price indices, and the other sectors, such as consumption and investment, are also deflated by appropriate price indices, then the total gross domestic product at constant prices will give a correct indicator of economic growth net of the changes in real income resulting from an improvement or deterioration in the terms of trade. Unfortunately, statistics of domestic product by either the output or expenditure method are available for only a small number of less developed countries.

If the national income at current prices is deflated by a purely domestic price index, further adjustments have to be made for changes

in the terms of trade. The difficult question is whether further adjustments are also needed when the national income is deflated by the wholesale price index or the cost of living index, both of which include the weights and prices of both export and import goods. There would be no need for further adjustment if the weights of the export and import goods in the wholesale and cost of living indices were the same as the relative importance of the exports and imports (weights) in the "Expenditure on Gross Domestic Product."

Since, in the absence of detailed information about the statistics on "Expenditure on Gross Domestic Product," it is almost impossible to know whether the weights are similar, both national income deflated by the cost of living index and national income deflated by the cost of living index and adjusted for the terms of trade have been used in this study as indicators of economic growth. The adjustment for the terms of trade has been made according to the following formula:

$$C=\left(\frac{P_e}{P_i}-1\right)V_b\times Q_c$$

where

C is the gain or loss (in value) from changes in the terms of trade;
P_e is the unit value index (or price index) of exports;
P_i is the unit value index (or price index) of imports;
V_b is the value of exports in the base year; and
Q_c is the quantum index of exports in the current year relative to the base year.

So far, only the quantitative effects of changes in the terms of trade have been discussed. Although it is not possible (and perhaps not even desirable) to isolate the indirect effects, it may be useful to indicate the most important. One of the major indirect effects arises as follows: An improvement in the terms of trade, insofar as it originates from an expansion in foreign demand for export goods, may lead to an increase in output of the export sector and possibly also of other sectors. The benefit therefore is not only the larger imports available in exchange for a larger quantity of exports but also the increase in production of goods consumed domestically. It could be argued that no adjustment is needed for this benefit because the expansion of output in the domestic sector is indicative of the ability of the economy to respond to an expansion in aggregate demand. Since the study is intended to determine this responsiveness of the economy or the long-run price elasticity of supply, the increase in output resulting from a rise in export prices should not be excluded.

Another major indirect effect arises because an improvement in the terms of trade increases real income, and thus affords a better opportunity to save and invest a larger proportion of the national income. Here again, no adjustment may be needed, because every increase in output affords the same opportunity, and the purpose of the study is to determine how far the country avails itself of the opportunity for greater savings and investment.

Other Publications

Balance of Payments Yearbooks

The Balance of Payments Yearbook, Volume 11, is being issued as a series of loose-leaf sections; thus data for each country are published as rapidly as they become available. The first sections in the volume were issued in June 1959, and the last will probably be issued in April 1960. When completed, the volume will contain basic statistics for the years 1957 and 1958 for about 75 countries, and it will bring to date the basic statements in Volumes 5, 8, 9, and 10.

The five volumes, used together, will provide a comprehensive record of the most recent balance of payments data available for the period 1947-58. They include a statement of the concepts and definitions employed throughout the Yearbook series; basic statistics, with comprehensive explanatory notes, for the countries covered; regional details for about two thirds of these countries; consolidated area statements for such country groups as the United States and Canada, the sterling area, OEEC countries, and the Latin American Republics; and summary statements, expressed in U.S. dollars and covering several years, for most individual countries.

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